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University undergraduates in political science were subjected to two types of teaching techniques: simulation (game playing) and case study. Personality factors of motivation and cognitive style were determined for the students in each group. These were considered the intervening variables. The students were tested before and after the course for knowledge of facts and principles. Results were largely inconclusive although two important findings can be stated: behavioral measures of interest reveal simulation to be more involving and interesting than case studies, and simulation offers much more student-to- student feedback than case discussion sections. Many reasons are given for believing that traditional methods of presenting subject-matter might be reexamined. Simulation may offer a relatively rich set of possibilities for accommodating the needs in terms of reevaluated goals of education and testing procedure.

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A COMPARISON OF SIMULATION, CASE STUDIES, AND PROBLEM PAPERS IN TEACHING DECISION-MAKING

Cooperative Research Project No. 1568

Anderson, Hermann, Robinson, Snyder
Northwestern University

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Cooperative Research Project No. 1568

Lee F. Anderson
Margaret G. Hermann
James A. Robinson, Coinvestigator,
Richard C. Snyder, Coinvestigator[#]

Northwestern University
Evanston, Illinois

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The Problem for Research

"Simulation" and "case studies" are among a number of supplementary teaching aids available for university courses in political science.* The newer technique, simulation, has been used at several universities to assist instruction in international relations, foreign policy-making, national security policy, urban politics, and political parties and elections.[1] Case studies are available for an even wider range of courses, including introductions to American government, public administration, party organization, legislative processes, and public law.[2] In fields other than political science, similar techniques are also evident. The number of business games or simulations exceeds 100,[3] and less numerous games have been designed for educational administration, Congress, career choices, and diplomacy, to name but a few.[4] The case method is well-known in schools of law and schools of business, and it has recently been added to the teaching of the history of science and of research methodology in sociology.[5]

Different types of simulations and cases and their uses have been described and discussed elsewhere.[6] In general, the evaluation of games and cases as supplementary instructional aids has been impressionistic and hypothetical, that is, the consumers of these teaching methods have reported their personal experiences with them and advanced claims for and criticisms of them. However, relatively little social scientific research has been undertaken to determine whether the claims for particular simulations or case studies are in fact achieved or to compare the actual effects of alternative methods. As an example, the Ford Foundation provided millions of dollars to induce business schools to use business games, but their investment in evaluation of the success or failure of this innovation extended primarily to calling a conference to discuss the subject, not to research it.[7] In political science, simulation and cases have been introduced by some of the most empirically-oriented scholars in the field, but their empirical investigations have rarely extended to their teaching innovations.[8] Nor have educational psychologists added games and cases to the instructional methods they investigate.[9]

---

*As the title of this report and the substance of the original proposal indicate, our intention was to compare simulation with both case studies and problem papers. However, the discovery of a textbook of case-problems for the International Relations course led us to drop the comparison of simulation with problems and confine research and analysis to a comparison of simulation and case studies. Given the subsequent small enrollment in that course and Administrative Process, we were glad we made this decision.

We believe that it is of relevance to political scientists to have empirical studies of how their subject-matter is communicated to students. Most political scientists are also university teachers of the liberal arts and sciences[10] and, as a practical matter, deserve the guidance of experiments to supplement their personal experience. Innovations such as games and cases often tend to be followed by uncritical waves of enthusiasm or skepticism. One way of counteracting excessive enthusiasm and answering skepticism is by quasi-experimental comparison of alternative methods.[11]

However, there are additional reasons, other than the practical educational one, for investigating differential effects of teaching devices. We mention two. First, since Plato's time, political analysts have been concerned with the impact of education on political interests and values; in modern parlance this is the focus of studies of "political socialization." Second, the understanding of decision-making practices among policy-makers, and of normative proposals for altering such practices, require knowledge of the training and preparation of decision-makers.

Many governmental (and private) organizations conduct special seminars and institutes to prepare their employees or to train them in mid-career. It is of political relevance whether alternative teaching devices might differ in their usefulness to such programs.[12]

This article reports the results of a comparison of one kind of simulation with case studies in teaching three upperclass undergraduate courses (total enrollment = 134) at Northwestern University in 1962-63. The special form of simulation was a slight modification of the Inter-Nation Simulation developed by Harold Guetzkow and associates;[13] the case studies included individual cases written either for research or teaching purposes and programmatic collections of cases, such as those prepared under the auspices of the Inter-University Case Program and the Eagleton Institute of Politics of Douglass College, Rutgers University. The three courses in which the comparisons were made were American Foreign Policy (N = 57), International Relations (N = 47), and Administrative Process (N = 30).

The Inter-Nation Simulation is readily adaptable for emphasis either on the systemic inter-relations of units (nations) in the simulation or to the internal decision processes of the units. The course in American Foreign Policy, taught by Dr. Lee F. Anderson, emphasized the intra-organizational factors which contribute to a nation's policy toward the external world. The International Relations course, taught by Professor Harold Guetzkow, concentrated on the inter-actions among nations rather than the intra-foreign office activities. The Administrative Process course, taught by Dr. James A. Robinson, dealt primarily with decision-making processes in organizations irrespective of the content of the organization's decisions.

A large number of individual case studies of foreign policy decisions were available for the first course.[14] Although no casebook was extant, the individual studies were reproduced and distributed to students in the case section. The International Relations course had the benefit of a book of case-problems.[15] The Administrative Process course used some ICP, Eagleton, and a few other cases.[16]

The experimental procedure was the same throughout all courses. All students met together for two one-hour lectures each week; then one-half attended a simulation section and the other half attended a case section. The simulation group met one afternoon weekly for three hours to participate in a simulated decision situation and for discussion of the relevance of the simulation to the course; the case section met on another afternoon for approximately the same length of time to discuss cases and relate them to other course materials. The assignments of students to sections were made during the first week of the courses on the basis of intelligence (as measured by scores on the Scholastic Aptitude Test), grade-point average, and certain personality data collected at an early class meeting (motivations toward achievement, affiliation, and power, and cognitive style).

Personal motivations toward or needs for achievement (n ach), affiliation (n aff), and power (n power) were measured by an adaptation of instruments developed by McClelland et al., and Atkinson of the Thematic Apperception Test.[17] Students were designated as high or low in need for achievement, high or low in need for affiliation, and high or low in need for power according to whether their scores fell above or below the class median.*

---

*Scores on TAT are determined by content analysis of short essays written in response to the projection on a screen of several penciled sketches. The content analysis was done for each of the three courses by the same two scorers. The rank order correlations between their scores on a sample of protocols were as follows: Males: n ach, .83; n aff, .83; n power, .66. Females: n ach, .84; n aff, .73; n power, .66.

Cognitive style refers to levels of abstractness-concreteness in cognitive structure. Harvey, Hunt, and Schroder[18] suggest that this level varies according to the "stimulus boundness of the individual." The more concrete the person, the more bound to the stimulus he is, i.e., the stimulus tends to dictate his response. The more abstract the person, the less bound to the stimulus he is, i.e., the greater the ability to abstract relations from experience and organize them in terms of their interrelatedness. Cognitive style was measured by the Situational Interpretation Test which ranks individuals by quartiles along a continuum from the most concrete to the most abstract. Throughout this paper we will refer to the four groups as concrete, moderately concrete, moderately complex, and complex.

These personality variables were selected for several reasons. First, student motivations toward achievement and affiliation have been found to interact with teaching methods and practices in other educational experiments. If our research was to be related to the continuing developments of educational psychology, this decision seemed imperative. Second, these same motivations, along with motivations toward power, have a history of interest to political analysts, and in so far as possible, we hoped to relate our teaching experiment to some of the continuing and basic concerns of political theory. McClelland's study of the relation of n ach, n aff, and n power to economic growth is perhaps the most impressive demonstration of the relevance of these personality variables to political theory.[19] The theory and research inspired by Lasswell on the relation of power and personality to politics constitutes another theoretical interest of political analysts, to which we hoped our work might not be unrelated.[20] Third, Driver had researched the influence of variations in concreteness-abstractness of cognitive style on decision-making in an earlier use of the Inter-Nation Simulation.[21] If relations could be found between cognitive style and decision behavior in the simulation, it seemed reasonable to investigate hypothetical relations between cognitive style and learning in the simulation.

Criteria for Comparison: Hypotheses

The critical problem in teaching experiments is the "criterion problem," that is, the selection of the dependent variables to which one tries to predict. Put another way, if simulation and cases differ in their instructional effects, in what ways would we expect them to vary? In short, what differences do the differences make?

Our search for hypothetical differences between simulation and cases was three-fold. First, we drew upon our personal experience and observation of students and other participants in simulation and case discussions. In this respect, we were particularly influenced by an early paper by our colleague, Dr. Chadwick F. Alger, who introduced his students of international organization to simulation during one academic quarter for three years.[22] Second, we drew upon the collective experience of a number of other teachers at several institutions who had supplemented their usual course materials with games or cases. Most of this experience was anecdotal, impressionistic, and usually undiscriminating in its claims for either simulation or cases.[23] Finally, we drew upon the accumulated theoretically-oriented, empirical research by educational psychologists.[24] Although many teaching experiments report negative results or no differences between and among methods, recent efforts have been more successful in finding differences which are both statistically and theoretically significant. This has especially been so when account is taken of the interaction between method and student-characteristics.

This search-strategy led to two broad kinds of criteria to which to predict. One was long-run and included effects on student career choices, reading interests, and political behavior. The other was short-run and included classroom behavior and course learning. The research setting, three relatively small classes, and the time limitations of an academic year of observation plus an additional period for data analysis made it impracticable to undertake a long-term, longitudinal research design. The more appropriate goal was to focus on short-term differences in student performance.

Student performance seemed to us subject to analysis in the form of both intervening and dependent variables. We had reason to think that simulation might increase student interest more than other methods, and this interest in turn would affect student learning. Thus, we began by considering interest as an intervening variable between method and learning. Similarly, we were impressed that simulation, with its one-hour decision periods during which results of decisions taken the previous period are reported to students, provides feedback to the student on the relation between his decisions and their outcome in ways unusual in other methods. So we regarded feedback as an intervening variable between method and learning. In addition, we thought that "learning by doing" and the vicarious experience of simulation might make students more explicit about the concepts and content of traditional course materials. Explicitness, then, might also intervene between method and learning.

As for the content of "learning" itself, we hypothesized three kinds. The first two were quite conventional, discrete factual material, and principles, i.e., theories of the special field of study. We were also impressed by the empathy or appreciation of real-world politics which some students apparently gained from simulation experience. We had in mind such things as the capacity to take the participant's perspective in analyzing or evaluating a decision or event. For example, students who represented small countries in the simulation sometimes said that they "understood" for the first time how small nations' representatives see the world. Others who experienced a communications breakdown in an overloaded information system seemed to comprehend that organizational factors, not just Original Sin, can explain unwanted decisional outcomes. However, we had such difficulties in operationalizing empathy that it detracted from work on the other variables; regrettably we dropped further investigation of that variable.

Thus, we were left with five criteria on which simulation might differ from alternative methods, interest, feedback, explicitness, facts, and principles. We could have compared simulation against "nothing," as it were. That is, we might have compared students who received both lectures and simulation with students who received only the lectures. However, this seemed to load the dice in favor of simulation since the experimental group would have more teacher time, special attention, and probably many more opportunities for learning. Because the case method enjoyed such a long history of favorable reception among political scientists, and because cases seemed so well developed for teaching purposes, we undertook to challenge simulation with what seemed to us to be the strongest alternative available.

Accordingly, we predicted that students in simulation would exhibit greater course interest, receive more feedback, demonstrate greater explicitness, master more facts, and grasp principles better than students in the case study sections. As we discuss the results for each of these five intervening and dependent variables, we will elaborate the reasoning and theorizing underlying the predictions in favor of simulation.

Interest

Probably the most frequently cited claim for simulation is that it heightens student interest, which in turn promotes learning. Whether in political science or business studies, games and simulation seem consistent with C. P. Snow's recommendation to put the student in the position of the original discoverer as a way of exciting him about research and enticing him to creative work.[25] Nevertheless, the reports on student interest are not uniform. At the Carnegie Institute of Technology, where a business management game extends throughout a semester and is the equivalent of one of five graduate courses, the game is disliked by some students. At the University of Wisconsin boredom and absenteeism were observed among students who occupied some of the less important roles in a political game.[26]

By interest we meant the student's involvement in the course. We assume that students who are highly interested will attend class more regularly, purchase more reading materials, read more of them, participate in more peripheral activities such as lectures, and undertake more volunteer work than students who are less interested. When these assumptions about interest or involvement are clearly stated, a number of potential instruments become available for measuring interest. Observation of the use of closed reserve materials in the library, of attendance at non-required discussions or lectures, records of book purchases at local stores, and student comparison of time spent on a course using simulation with courses not using it -- all these are among possible observational and self-reporting instruments for measuring interest. In addition, each course may have a graduate teaching assistant who may act as informant, and instructors may keep notes identifying students who ask questions, remain after class, come to their offices, telephone them at home, and exhibit other signs of interest.*

We undertook to develop and use several measures of interest, on the assumption that interest is probably multidimensional and that findings supported by several measures deserve greater credibility than findings supported by single indicators.[27] Altogether we had ten measures of interest, including the students' reports of the amount of reading they did on the subject-matter of the course, their comparison of their interest in the course with others taken simultaneously, their perception of interest in the subject, their perception of interest in political science, their preference for case or simulation, their attendance in class, their visits to the professor's office, their use of special reading materials placed in the reserve room of the college library, their descriptive evaluation of the course at the end of term, and their rate of participation in lab section.

Data on these ten indicators of interest were available for 23 groups among the participants in the three experimental courses. These groups consist of all the students enrolled, all males, all females, and of the males and females separately grouped according to high and low achievement, high and low affiliation, high and low power, and males and females separately grouped in terms of their cognitive style (concrete, moderately concrete, moderately complex and complex).

---

*As already noted, we began by thinking of interest as primarily an intervening variable, one of the mechanisms to produce learning of facts and principles. However, even if teachers are not in the business of interesting students for interest's sake, it may be that different techniques differentially affect substantive interests and therefore subsequent reading and perhaps even career plans. This is what is meant when evaluators speculate that the effects may be long-term. Six weeks after one course, we tried to follow up on both the simulation and case groups and to give tests for retention, as distinguished from measures of recall, which final examinations resemble more. However, the costs of seeking out the students, given our other experimental commitments, caused us to drop this important feature.

When one lists the findings, as in Table 1.1, they seem to be without pattern. Certainly, neither simulation nor case is clearly more effective in stimulating interest. And most certainly, the results do not fit the predictions we made in advance, namely, that simulation would be uniformily superior to cases in exciting student interest and involvement. Nevertheless, an unexpected pattern emerges, and it is that the case method is more successful than simulation in eliciting student interest as measured by students' *perceptions*, but measures of student *behavior* indicate that simulation is more successful than case in affecting student interest and involvement. In support of this finding, we report evidence on five perceptual measures and five behavioral measures of interest. In considering each measure, we shall first report results (whether statistically significant or not) for all students in the three courses (N = 134). Only for this aggregate will we report non-significant results. For the other 22 groups, we shall report significant findings only; however, when several small groups show statistically significant differences on the same variable, we will not always report every table but instead make explicit only the proposition for which significance has been obtained. In each table we display the full range of responses and report the chi-square value, although in some instances the number of entries in a cell is too small for use of chi-square. In every such instance, we combined small cells to meet the minimum requirements for the use of chi-square. We then computed the chi-square values for these collapsed tables, and if this value were not significant, the original distribution was not accepted as significant. In one instance, in which the chi-square value of the collapsed table was

Table 1.1

Summary Of Ten Interest Measures For 23 Groups

	Perceptual Measures					Behavioral Measures				
	A[1]	B	C	D	E	F	G	H	I	J
1. All Students	--[2]	--	--	--	PC	--	--	PS	--	PS
2. All Males	--	--	--	--	PC	--	PC	PS	--	PS
3. All Females	--	--	--	--	PC	--	--	PS	--	PS
Males										
4. High N Ach	--	--	--	--	PC	--	--	--	PS	PS
5. Low N Ach	--	--	--	--	PC	--	PC	PS	PC	PS
6. High N Aff	--	PS	--	--	PC	--	--	PS	PS	PS
7. Low N Aff	--	--	--	--	PC	--	--	--	PS	PS
8. High N Power	--	--	--	--	PC	--	--	PS	PS	PS
9. Low N Power	--	--	--	--	PC	--	PC	PS	PS	PS
10. Concrete Cognitive Style	--	--	--	--	PS	PC	--	--	PS	PS
11. Moderately Concrete Cognitive Style	--	--	--	--	PS	--	--	--	PS	PS
12. Moderately Complex Cognitive Style	--	--	--	--	PC	--	--	--	--	--
13. Complex Cognitive Style	--	--	--	--	PC	--	--	PS	PS	PS
Females										
14. High N Ach	--	--	--	--	PC	--	--	PS	PC	PS
15. Low N Ach	--	--	--	--	PC	--	--	PS	PC	PS
16. High N Aff	--	--	--	--	PC	--	--	--	PS	PS
17. Low N Aff	--	--	--	--	PC	--	--	PS	PC	PS
18. High N Power	--	--	PS	--	PC	PS	--	--	PS	PS
19. Low N Power	--	--	--	--	PC	--	--	PS	PS	PS
20. Concrete Cognitive Style	--	--	--	--	PC	--	--	PS	--	PS
21. Moderately Concrete Cognitive Style	--	--	PC	--	PC	--	PC	--	PC	PS
22. Moderately Complex Cognitive Style	--	--	--	--	PC	--	--	--	PS	PS
23. Complex Cognitive Style	--	--	PS	--	PC	--	--	--	--	PS

Table 1.l continued--

[1] Columns correspond to the following variables:

A. Perception of amount of reading on subject (differences analyzed by chi-square test)
B. Perception of relative course interest (chi-square test)
C. Perception of interest in course (chi-square test)
D. Perception of interest in political science (chi-square test)
E. Perception of interest in lab section (no test of significance)
F. Behavioral interest expressed by reading (t test)
G. Behavioral interest expressed by visiting professor (t test)
H. Behavioral interest expressed through attendance (t test)
I. Course evaluation essay (number of cases too small for test of significance on any groups except all students, all males, all females)
J. Behavioral interest expressed by rate of participation in lab section (t test)

[2] A blank line indicates no significant difference between case and simulation sections in amount of interest observed by indicators for this variable. PC (Pro-Case) indicates significantly more interest in case section, except in column E for which no test of significance was possible for small groups. PS (Pro-Simulation) indicates significantly more interest in simulation section. .05 level of probability was used to define significance.

significant but the value for the original distribution was not, we accepted the difference as significant.*

Perceptions of interest

Our way of eliciting perceptions of interest was to ask students a number of questions on a "Course Evaluation" questionnaire at the end of term (for the text of the questionnaire, see Appendix B). This was administered at the last regular meeting of the course; the cover sheet instructed students to elect one of their number to collect the questionnaires and deliver them to the office of the Secretary of the Department of Political Science, where they would be held until the instructor filed his grades for the course. This procedure was designed to assure students that their evaluations of the course would not influence their grades. So far as we could tell, there was no evidence that students doubted the integrity of this procedure, and in each course they cooperated by responsibly handling the delivery of the questionnaires.

Perception of amount of reading on subject. Among students' perceptions which we sought was their estimate of their reading on the subject-matter of the course.** We asked:

---

* Throughout this report, we have followed Blalock's advice to "lean over backwards" to find evidence against our hypotheses. Thus, for example, two-tailed tests were used in determining the significance of differences. It is no secret that we set out to study simulation, not cases, and that our sympathies and hopes lay with simulation. To counteract this bias, we have given the benefit of every doubt to the case method. See Herbert M. Blalock, Jr., Social Statistics. New York: McGraw-Hill, 1960, p. 125.

** We illustrate each question as worded in American Foreign Policy. The only change in questions in other courses was to substitute for the title of the course.

8. Do you find that you do more general reading on American Foreign Policy (aside from reading required for class work) now than you did at the start of the semester?
   1. Yes, a great deal more.
   2. Yes, somewhat more.
   3. No, about the same.
   4. No, I do less now.

For all students in the three courses, there was no difference in their perception of changes in the amount of reading on the subject of the course. No one claimed to be reading less, and as Table 2.1 shows, more than half of each section said they were reading somewhat more or a great deal more than when they began the course.

Table 2.1

Among All Students There Is No Difference Between Sections In Perceived Amount Of Reading

Perceived Reading:	Great Deal More	Somewhat More	About Same	Less	No Response	Total
Section:						
Simulation	9	34	25	0	3	71
Case	10	34	18	0	1	63
Total	19	68	43	0	4	134

X^2 = .923, not significant at .05 level

Similarly, no significant differences between sections were found when we looked at the other 22 groups. No differences were observed among males and females, according to any of the personality measures, or in variation with cognitive style.

Perception of relative course interest. The Course Evaluation form asked each student to compare his interest in this course with his interest in other courses being taken at the same time. The question read:

18. Under the word "course" below, list all the courses which you have taken this quarter. Rank order these in terms of your interest in them (1 being the most interesting).

Interest Rank　　　Course

This question did not uncover much difference between those who took simulation and those who had cases. For all students there was no significant difference between sections, as Table 3.1 shows.

Table 3.1

Among All Students There Is No Difference Between Sections In Relative Interest In Course

Relative Interest in Course:	Ranked First	Ranked Second	Ranked Third	Ranked Fourth	No Response	Total
Section:						
Simulation	27	29	9	5	1	71
Case	21	19	17	3	3	63
Total	48	48	26	8	4	134

$X^2 = 5.058$, not significant at .05 level

Only one of the 23 groups exhibited a significantly greater perception of relative course interest between the experimental sections, and that was the group of males with high n aff. As Table 3.2 indicates, these males who were in simulation reported a higher ranking of their course than those who were in cases. Although we are not surprised that personality groups show a finding of this sort, we expected there would be more such differences throughout the several personality groups. So we attach relatively little substantive significance to this single statistically significant finding for this variable.

Table 3.2

Males With High N Aff Express More Relative Interest In Course If In Simulation Than In Case

Relative Interest in Course:	Ranked First	Ranked Second	Ranked Third	Ranked Fourth	No Response	Total
Section:						
Simulation	12	9	1	1	1	24
Case	9	3	7	0	0	19
Total	21	12	8	1	1	43

$X^2 = 8.684$ significant at .05 level

Perception of interest in subject. Each student was asked to report whether and to what extent his interest in the subject was stimulated by the course. The Course Evaluation form asked:

5. To what extent would you say your interest in American Foreign Policy has been stimulated as a direct result of this course?
    1. It has been stimulated quite a bit.
    2. It has been somewhat stimulated.
    3. It has been slightly stimulated.
    4. It has not been stimulated at all.

There was no significant difference between sections for all students, as Table 4.1 indicates.

Table 4.1

Among All Students There Is No Difference Between Sections In Perception Of Interest In Subject

Perception of Interest in Subject:	Stimulated Quite A Bit	Somewhat Stimulated	Slightly Stimulated	Not Stimulated At All	No Response	Total
Section:						
Simulation	37	23	5	4	2	71
Case	33	19	8	1	2	63
Total	70	42	13	5	4	134

X^2 = 2.619, not significant at .05 level

Three of the female subgroups showed significant differences in the relations between teaching method and interest as measured by this question.

1) Females with high n power in simulation perceived more interest in the subject than females with high n power in case studies, as shown in Table 4.2.

Table 4.2

Females With High N Power Perceived More Interest In The Subject If In Simulation Than In Case

Perception of Interest in Subject:	Stimulated Quite A Bit	Somewhat Stimulated	Slightly Stimulated	Not Stimulated At All	No Response	Total
Section:						
Simulation	8	1	2	0	1	12
Case	2	7	1	0	0	10
Total	10	8	3	0	1	22

X^2 = 8.495, significant at .05 level

2) Females with moderately concrete cognitive styles who were in case studies perceived more increase in interest in the subject than similar females who were in simulation.

3) Females with complex cognitive style who were in simulation perceived more increase in interest in the subject than similar females in case studies.

In other words, simulation and interest were positively related for two groups, and case and interest were positively related for one group, in so far as interest is measured by this one question.

Perception of interest in political science. A similar question was asked about the student's perception of his interest in political science. The Course Evaluation form asked:

6. To what extent would you say that your interest in political science in general has been stimulated as a direct result of this course?
   1. It has been stimulated quite a bit.
   2. It has been somewhat stimulated.
   3. It has been stimulated slightly.
   4. It has not been stimulated at all.

There was no significant difference between sections for all students, as Table 5.1 shows.

Table 5.1

Among All Students There Is No Difference Between Sections In Perception Of Interest In Political Science

Perception of Interest in Political Science:	Stimulated Quite A Bit	Somewhat Stimulated	Slightly Stimulated	Not Stimulated At All	No Response	Total
Section:						
Simulation	25	24	13	5	4	71
Case	26	18	12	6	1	63
Total	51	42	25	11	5	134

$X^2 = .918$, not significant at .05 level

Perception of interest in lab section. The final perceptual measure of interest was a question asking the student to indicate, regardless of the lab section in which he participated, what would be his preference between simulation and case studies. The Course Evaluation form asked:

> 15. Had you been able to choose the type of lab session to attend at the beginning of this quarter, which would you have preferred? Case Study Lab____; Simulation Lab____. Would your preference be different now? Yes____; No____.

We computed, for each group, the percent who preferred case and the percent who preferred simulation. The percent who preferred the section other than the one to which they had been assigned was subtracted from the percent who preferred the section in which they actually participated. This yielded a measure of perceived interest in or preference for one section over the other; those who voted for the section opposite theirs presumably showed less interest than those who voted for the section in which they had been members. The data for all students are displayed in Table 6.1.

Table 6.1

More Simulation Students Prefer Case Than Case Students Prefer Simulation

Section Preference:	Case	Simulation	No Response	Total
Section:				
Simulation	26	44	1	71
Case	46	15	2	63
Total	72	59	3	134

Only two groups, the males with greatest and moderate cognitive concreteness, preferred simulation to cases. The range of percentage differences in favor of the case method was from 1% to 75%. No test of significance was applied to these data, but the interpretation is clearly that students perceive the case as preferable to simulation. This measure, more than any other, expresses perceived interest in favor of the case method.

Summary. The major conclusions from the perceptual measures of interest are (1) that only one of five such measures discriminates simulation and case students; (2) that that one is not subject to test of significance; (3) but for what it is worth, that one measure is a pro-case finding in that it indicates that more simulation students prefer case than case students prefer simulation. (The reader is referred again to Table 1.1.)

Behaviors of interest

To the extent that students' perceptions of these two supplementary teaching methods vary, they tend to favor the case method. What is striking is that observational data of their actual course behavior, i.e., participation, indicates just the reverse, that more interest is displayed by students in simulation than in cases.

Behavioral interest expressed by reading. Like most college libraries, Deering Library of Northwestern University maintains a reserve reading room. Procedures governing the use of materials are typical. Some books are on open reserve and may be removed from open shelves by the reader and used in the reading room until the library closes at the end of the day. Other books are on closed reserve and may be obtained only upon presentation of a call slip. Some of both open and closed reserve books may be checked out overnight. Each instructor in the three courses placed on closed reserve a large number of references to journal articles, chapters, books, and similar material. The Reserve Room personnel agreed to save all call slips for closed reserve items, from which we could cull evidence of our students' use of these materials.

This objective measure yielded no significant differences between sections for the aggregate of students, as shown in Table 7.1.

Table 7.1

Among All Students There Is No Difference Between Sections In Behavioral Interest Expressed By Use Of Closed Reserve Reading

Mean Use		
	Simulation	1.7692
	Case	4.2727
Difference		2.5035, not significant at .05 level as determined by t test

However, for two of the 23 groups, male students whose cognitive style was most concrete and female students with high n power, significant differences were found between simulation and case. In the male group, students in case studies used closed reserve reading materials significantly more than those in simulation, but the females with high n power who were in simulation used the library readings significantly more than those in case studies. Tables 7.2 and 7.3 report data for these two groups.

Table 7.2

Males With Concrete Cognitive Style In Simulation Use Closed Reserve Reading More Than In Case

Mean Use	
Simulation	.3000
Case	2.5000
Difference	2.2000, significant at .05 level as determined by t test

Table 7.3

Females With High *N Power* in Simulation Use Closed Reserve Reading More Than In Case

Mean Use	
Simulation	3.0000
Case	1.6000
Difference	1.4000, significant at .05 level as determined by t test

It might be noted in passing that the mean use may seem relatively small to many teachers, not quite two times per simulation students and just more than an average of four for case students.

Behavioral interest expressed by visiting professor. Each instructor maintained a calendar or similar record of the students who visited him during office hours. Two of the three instructors attached an appointment sheet to their door and invited students to "sign up" for special times.

Notes of unscheduled visits were also kept. Because the number of visits by a student was rarely more than one, we dichotomized the data, separating students who made no visit from those who made one or more. Among all students there was no difference between sections in the frequency of office visits, as shown in Table 8.1.

Table 8.1

Among All Students There Is No Difference Between Sections In Frequency Of Visits To Professor

Number of Visits:	None	One or More	Total
Section:			
Simulation	46	25	71
Case	33	30	63
Total	79	55	134

$X^2 = 2.124$, not significant at .05 level

However, four of the 23 groups showed significant differences between case and simulation sections. In each group, more students in the case section visited the professor than did students in simulation.

The four groups in which case students paid more visits to the professor than simulation students were all male students, males with low n ach, males with low n power, and females with moderately concrete cognitive style. Table 8.2 reports the data for the largest of these groups -- all males.

Table 8.2

Male Students In Case Visited Professor
More Than Those In Simulation

Number of Visits:	None	One or More	Total
Section:			
Simulation	32	15	47
Case	18	24	42
Total	50	39	89

$X^2 = 5.734$, significant at .05 level

Behavioral interest expressed through attendance. The instructors did not keep attendance at lectures, but the Observers,[*] who were present at each section meeting, noted who attended, who remained after the formal close of the section meeting, who was tardy, and who left before the official termination hour. Each individual was then given an attendance score consisting of the number of times he attended his section plus the times he remained afterward minus the times he was tardy and left before termination.

This objective measure of interest revealed that in 12 of the 23 groups the simulation section displayed more interest than the case section. This was true for the aggregate of all students, for all males, for all females, and for males with low n ach, males with high n aff, males with high n power, males with low n power, males with the most complex cognitive style, females with high n ach, females with low n aff, females with low n power, and females with most concrete cognitive style. Tables 9.1, 9.2, and 9.3 report data for all students, all males, and all females.

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[*] The presence of the Observers was explained to the sections at the first meeting and justified in terms of our desire to contribute to better undergraduate teaching on the basis of empirical research.

Table 9.1

Among All Students Those In Simulation Have Higher Attendance Scores Than Those In Case

Mean Attendance Score		
	Simulation	57.3239
	Case	48.7460
Difference		8.5779, significant at .05 level as determined by t test

Table 9.2

Males In Simulation Have Higher Attendance Scores Than In Case

Mean Attendance Score		
	Simulation	58.5957
	Case	50.4048
Difference		8.1909, significant at .05 level as determined by t test

Table 9.3

Females In Simulation Have Higher Attendance Scores Than In Case

Mean Attendance Score		
	Simulation	54.8333
	Case	45.4286
Difference		9.5865, significant at .05 level as determined by t test

Behavioral interest expressed through Course Evaluation essay. At the end of the Course Evaluation form, students were asked an open-end question to which they could respond with any additional comments about the course and the section in which they participated. In contrast to the perception of interest questions, there was no element of forced-choice about this item; indeed, students were invited rather than instructed to answer. Thus, whether they commented or not and the direction of their comment resemble behavior more than perception. The question read:

20. If you feel there are things about American Foreign Policy which you had thought you'd like to get out of this course and didn't, would you please list them in the following space.

21. The rest of this page is for any additional comments which you would care to make.

The contents of these responses were analyzed for the presence of positive comment, negative comment, or mixture of both positive and negative comment. For 16 of the groups, the students who were in simulation made more positive comments than students in cases, while in four of the groups the case section students offered more positive comments. These data are not so fully subject to tests of significance, because of the reduced number for analysis, owing to the fact that students had a choice of whether to write any comments at all. We have reported the direction of their comments, either positive or negative, although for all students writing either strictly positive or strictly negative comments (N = 64), the differences are not significant, as Table 10.1 shows.

Table 10.1

Among All Students Commenting Either Positively Or Negatively
There Is No Difference In Behavioral Interest
Expressed Through Course Evaluation

Comment:	Positive	Negative	Total
Section:			
Simulation	15	20	35
Case	11	18	29
Total	26	38	64

$X^2 = .167$, not significant at .05 level

Behavioral interest expressed by rate of participation in lab section. Rate of participation was computed by counting the number of communications of each student in the lab sections and dividing by the number of lab sections he attended. The number of participations per section attended was overwhelmingly greater for simulation than for case. In fact, the differences between the means for simulation and case for 22 of the 23 groups were statistically significant; only males with moderately complex cognitive style did not have significantly higher rates of participation than the corresponding males in the case section.

In one sense, this finding is not surprising, because simulation sections include national conferences, bi-lateral and multi-lateral conferences, and other small group sessions in which the opportunities for student participation might be expected to be more numerous than in traditional discussion sections. Yet, the proposition should not be taken as obvious, especially when we will find later that case sections have more instructor feedback to students than simulation sections. Not only is the proposition not obvious, it is not trivial, for as will be noted in the final section on implications, the promotion of activity may be one of the key ways of motivating students.

Summary. The major conclusions from the behavioral measures of interest are (1) that they are generally more effective than the perceptual measures in discriminating between simulation and case sections; (2) that three of the measures -- attendance, Course Evaluation essay, and rate of participation -- indicate greater interest among simulation sections; and (3) that these behavioral measures differ from the one perceptual measure in the direction of student interest. (The reader is referred again to Table 1.1.)

Feedback

Time is greatly compressed in any simulation. That is, of course, one of the purposes of a simplified operating model or replica of "real-world" processes. The objective is to simulate in less than real-world time certain central features of real-world processes. In the Inter-Nation Simulation decisions are made hourly on a Decision Form about the allocation of resources, and other decisions are taken during the same time period about negotiations, trades, votes, and statements. Depending upon whether the instructor decides to have more than one Decision Period during a laboratory session, students may or may not receive virtually immediate feedback on the consequences of the decisions recorded on the Decision Form. In these experimental sections, we had only one period per lab session in order to allow time for discussion and also to reduce the stress under which calculations of decisions were performed. However, less formal decisions received feedback in the reactions of other students in bi-lateral and multi-lateral negotiations.

The similarity between the prompt response from decisions and teaching machines is apparent. The feedback gives the simulator evidence of the relation of his actual decision outcome to the expected outcome. If the assumptions about "learning by doing," "learning through participation," etc., are right, students who have the experience of simulation feedback ought to learn differently (either at more rapid rates or perhaps learn different things). Although case studies and the discussion of cases may allow the student to consider alternative courses of action which the actors in the case might have taken, there is no "reality testing" of such alternatives. In short, there is no similar feedback from cases.

Originally, we planned only to identify and quantify some kinds of validation or feedback which simulators receive from their experience. However, as we considered teaching activity in alternative groups of students (e.g., those using case studies), we became aware that, like the figure who realized he had been speaking prose all his life, we have been "giving feedback" in discussion sections for a long while. The section leader offers cues of approval or disapproval to student questions, comments, and responses. Accordingly, we decided to observe both simulation and case sections and to record instructor feedback to students, student feedback to each other, and to supplement our direct observation with questions on the Course Evaluation form which would ask for students' perception of teachers' and fellow-students' feedback.

As in the presentation of data on interest, we shall first report data on perceptions of feedback and then summarize the observational or behavioral data. Table 11.1 is a summary of these findings.

Table 11.1

Summary Of Eleven Feedback Measures For 23 Groups

	Perceptual Measures								Behavioral Measures		
	A[1]	B	C	D	E	F	G	H	I	J	K
1. All Students	--[2]	--	PC	--	--	--	PC	PC	PC	--	PS
2. All Males	--	--	--	--	--	--	PC	PC	PC	--	PS
3. All Females	--	--	--	--	--	--	--	--	PC	--	PS
Males											
4. High N Ach	--	--	PC	--	--	--	PC	--	PC	--	PS
5. Low N Ach	--	--	--	--	--	--	PC	PC	PC	--	PS
6. High N Aff	--	--	--	--	--	PC	PC	--	PC	--	PS
7. Low N Aff	PC	--	--	PC	--	--	PC	--	--	--	PS
8. High N Power	--	--	--	--	--	PC	--	PC	--	--	PS
9. Low N Power	--	--	PC	--	--	--	PC	--	PC	--	PS
10. Concrete Cognitive Style	--	--	--	--	--	--	--	--	--	--	PS
11. Moderately Concrete Cognitive Style	--	--	--	--	--	--	--	--	PC	--	PS
12. Moderately Complex Cognitive Style	--	--	PC	--	--	--	PC	PC	--	--	PS
13. Complex Cognitive Style	--	--	--	--	--	--	PC	--	PC	--	PS
Females											
14. High N Ach	--	--	--	--	--	--	--	--	PC	--	PS
15. Low N Ach	--	--	--	--	--	--	--	--	PC	--	PS
16. High N Aff	--	--	--	--	--	--	--	--	PC	--	PS
17. Low N Aff	--	--	PC	--	--	--	--	--	PC	--	PS
18. High N Power	--	--	PC	--	--	--	--	--	PC	--	PS
19. Low N Power	--	--	--	--	--	--	--	--	PC	--	PS
20. Concrete Cognitive Style	--	--	PC	--	--	--	--	--	PC	--	PS
21. Moderately Concrete Cognitive Style	--	--	--	--	--	--	--	--	--	--	PS
22. Moderately Complex Cognitive Style	--	--	--	--	--	--	--	--	PC	--	PS
23. Complex Cognitive Style	--	--	--	--	--	--	--	--	--	--	PS

Table 11.1 continued--

[1] Columns correspond to the following variables:

A. Perception of amount of feedback from instructor to class (differences analyzed by chi-square test)
B. Perception of amount of positive feedback from instructor to class (chi-square test)
C. Perception of amount of negative feedback from instructor to class (chi-square test)
D. Perception of amount of impersonal negative feedback from instructor to class (chi-square test)
E. Perception of amount of feedback from instructor to self (chi-square test)
F. Perception of amount of positive feedback from instructor to self (chi-square test)
G. Perception of amount of negative feedback from instructor to self (chi-square test)
H. Perception of amount of impersonal negative feedback from instructor to self (chi-square test)
I. Ratio of participation to feedback (t test)
J. Ratio of positive feedback to negative feedback (t test)
K. Ratio of student feedback to instructor feedback (t test)

[2] A blank line indicates no significant difference between case and simulation sections in amount of feedback observed by indicators for this variable. PC (Pro-Case) indicates significantly more feedback in case section; PS (Pro-Simulation) indicates significantly more feedback in simulation section. .05 level of probability was used to define significance.

Perceptions of feedback

Perception of amount of feedback from instructor to class. The first feedback measure is the students' self-report of how frequently they thought the instructor used the work of students as the basis for discussion. The Course Evaluation form asked the following question:

1. Did your instructor in this course often use the work (reports, statements, questions, etc.) of students in the class as basis for class discussions?
    1. Yes, he did this in frequent class sessions.
    2. Yes, he did this in occasional class sessions.
    3. He did this in rare class sessions.
    4. He never did this.

No significant differences were found between simulation and case sections among the 23 groups, except for males with low n aff. The data for all students are reported in Table 12.1. Although no differences are found between simulation and case, it may be noted that most students in both sections report frequent feedback from instructor to student.

Table 12.1

Students' Perception Of Instructor Feedback To Class Does Not Differ Between Simulation And Case

Amount of Perceived Instructor Feedback:	Frequent	Occasional	Rare	Not At All	No Response	Total
Section:						
Simulation	50	15	2	3	1	71
Case	50	9	2	1	1	63
Total	100	24	4	4	2	134

$X^2 = 2.022$, not significant at .05 level

Among males with low n aff, those in case perceived more feedback from the instructor than those in simulation. The data are in Table 12.2.

Table 12.2

Males With Low N Aff In Case Perceive More Instructor Feedback To Class Than In Simulation

Amount of Perceived Instructor Feedback:	Frequent	Occasional	Rare	Not At All	No Response	Total
Section:						
Simulation	15	5	0	2	0	22
Case	21	1	0	0	1	23
Total	36	6	0	2	1	45

X^2 = 5.00, significant at .05 level for collapsed 2 x 2 tables (The two simulation "not at all" responses are combined with the five "occasional" responses.)

Perception of amount of positive feedback from instructor to class. In addition to asking the students for their perception of total feedback, we also sought their estimates of the approval-disapproval character of the instructors' responses to student participation. To obtain data on perceptions of positive feedback, the Course Evaluation form contained the following question:

4. Did your instructor express approval of the contributions of students?
   1. Yes, frequently.
   2. Occasionally.
   3. Rarely.
   4. Never.

No differences between simulation and case sections were found among any of the 23 groups. The "no differences" on this dimension for all students are displayed in Table 13.1.

Table 13.1

Students' Perception Of Amount Of Positive Instructor Feedback To Class Does Not Differ Between Simulation And Case Sections

Amount of Perceived Positive Instructor Feedback:	Frequent	Occasional	Rare	Not At All	No Response	Total
Section:						
Simulation	52	15	3	0	1	71
Case	54	8	0	0	1	63
Total	106	23	3	0	2	134

X^2 = 4.70, not significant at .05 level

Perception of amount of negative feedback from instructor to class. Although students in simulation and case sections did not differ in their perception of positive feedback from instructors, they differed significantly in their perception of negative feedback. The Course Evaluation form asked:

2. Did your instructor ever criticize students in class?
    1. Yes, he did this frequently.
    2. He occasionally did this.
    3. He rarely did this.
    4. He never did this.

Seven of the 23 groups perceived significantly more negative feedback in the case study sections than the simulation sections. The data for the aggregate of all students in the three courses are displayed in Table 14.1.

Table 14.1

Students In Case Perceive More Negative Feedback From Instructor Than In Simulation

Amount of Perceived Negative Feedback:	Frequent	Occasional	Rare	Never	No Response	Total
Section:						
Simulation	2	24	19	25	1	71
Case	5	31	15	10	2	63
Total	7	55	34	35	3	134

X^2 = 8.50, significant at .05 level

This same difference holds for six of the groups, including three groups of males and three of females. Males with high n ach, low n power, and with moderately complex cognitive style perceived more negative feedback in case sections than in simulation. Similarly, females with low n aff, high n power, and with most concrete cognitive style perceived more negative feedback from the instructor in the case than in the simulation section.

Perception of amount of impersonal negative feedback from instructor to class. We made an effort to distinguish impersonal negative feedback from negative feedback in general. The Course Evaluation form contained the following question:

> 3. Did your instructor 'depersonalize' his criticism of students' work, making it clear that he was criticizing the ideas expressed, but not the person expressing them?
>   1. Yes, he frequently did this.
>   2. He occasionally did this.
>   3. He rarely did this.
>   4. He never did this.

Among all students, this type of feedback was not differently perceived in simulation and case sections, as Table 15.1 indicates.

Table 15.1

Students' Perception Of Amount Of Impersonal Negative Feedback From Instructor To Class Does Not Differ Between Simulation And Case

Amount of Perceived Impersonal Negative Feedback:	Frequent	Occasional	Rare	Never	No Response	Total
Section:						
Simulation	50	10	3	2	6	71
Case	54	5	2	1	1	63
Total	104	15	5	3	7	134

$X^2 = 2.457$, not significant at .05 level

Moreover, significant differences in perception of impersonal negative feedback are observed for only one of the other groups –– males with low _n aff_. Table 15.2 displays these data.

Table 15.2

Males With Low _N Aff_ Perceive More Impersonal Negative Feedback In Case Than In Simulation

Amount of Perceived Impersonal Negative Feedback:	Frequent	Occasional	Rare	Never	No Response	Total
Section:						
Simulation	13	4	2	2	1	22
Case	20	2	0	0	1	23
Total	33	6	2	2	2	45

$X^2 = 6.131$, significant at .05 level

Perception of amount of feedback from instructor to self. So far we have reported measures of perceived feedback from instructor to the class as a whole. The Course Evaluation form followed such questions by asking for the students' perception of whether they personally received feedback. After being asked whether the instructor often used the work of students as the basis of class discussion (Question 1 on the Course Evaluation form), students were asked:

> ...were you one of the students whose work was used in this way?
> Yes____ No____

The distribution of responses to this question was not significantly different between case and simulation sections. Table 16.1 reports the data for all students.

Table 16.1

Students' Perception Of Amount Of Instructor Feedback To Self Does Not Differ Between Simulation And Case

Amount of Perceived Instructor Feedback to Self:	None	Some	Total
Section:			
Simulation	35	36	71
Case	27	36	63
Total	62	72	134

$X^2 = .557$, not significant at .05 level

Nor was there any difference on this measure for any of the other 22 groups.

Perception of amount of positive feedback from instructor to self. After asking whether the instructor ever expressed approval of student contributions, the Course Evaluation form (Question 4) contained the following probe, designed to identify whether the student perceived positive feedback to himself:

> ...were you one of the students whose contribution received approval?
> Yes____ No____

No significant differences were found between case and simulation sections for all students. Table 17.1 displays the data.

Table 17.1

Students' Perception Of Amount Of Positive Feedback From Instructor To Self Does Not Differ Between Simulation And Case

Amount of Perceived Positive Feedback from Instructor to Self:	None	Some	Total
Section:			
Simulation	27	44	71
Case	20	43	63
Total	47	87	134

$X^2 = .578$, not significant at .05 level

Among the other 22 groups, two showed more perceived positive feedback from instructor to self in case than in simulation sections. These were males with high n aff and high n power. Tables 17.2 and 17.3 set forth the data for these two groups.

Table 17.2

Males With High N Aff Perceive More Positive Feedback From Instructor To Self In Case Than In Simulation

Amount of Perceived Positive Feedback from Instructor to Self:	None	Some	Total
Section:			
Simulation	13	11	24
Case	4	15	19
Total	17	26	43

X^2 = 4.864, significant at .05 level

Table 17.3

Males With High N Power Perceive More Positive Feedback From Instructor To Self In Case Than In Simulation

Amount of Perceived Positive Feedback from Instructor to Self:	None	Some	Total
Section:			
Simulation	10	11	21
Case	3	17	20
Total	13	28	41

X^2 = 5.034, significant at .05 level

Perception of amount of negative feedback from instructor to self. After we asked students to report their perceptions of whether the instructor criticized students' contributions (Question 2, a measure of negative feedback on which case students perceived more than simulation), we asked:

...were you one of the students who was criticized? Yes____ No____

The data on these responses are displayed in Table 18.1 and reveal that significantly more students in case sections perceived negative feedback from instructors to themselves than in simulation.

Table 18.1

Students In Case Perceive More Negative Feedback From Instructor To Self Than In Simulation

Amount of Perceived Negative Feedback from Instructor to Self:	None	Some	Total
Section:			
Simulation	63	8	71
Case	40	23	63
Total	103	31	134

$X^2 = 11.959$, significant at .05 level

Similar differences between case and simulation sections were found for eight other groups: all males, males with high n ach, males with low n ach, males with high n aff, males with low n aff, males with low n power, males with moderately complex cognitive styles, and males with complex cognitive styles. These findings sharply separate males from females; all male groups, except those with high n power and those with concrete cognitive style or moderately concrete cognitive style, perceived more negative feedback from instructor to self. No female group perceived a significant difference.

Perception of amount of impersonal negative feedback from instructor to self. After asking students whether their instructor ever depersonalized criticism, we inquired whether they were ever the recipients of criticism directed at ideas rather than their source (Question 3). Table 19.1 reports the data for all students and reveals significantly more perceived impersonal negative feedback from instructor to self among case section students than among simulation students.

Table 19.1

Students In Case Perceive More Impersonal Negative Feedback From Instructor To Self Than In Simulation

Amount of Perceived Impersonal Negative Feedback from Instructor to Self:	None	Some	Total
Section:			
Simulation	46	25	71
Case	30	33	63
Total	76	58	134

$X^2 = 4.009$, significant at .05 level

This same finding holds for four other groups -- all males, males with low n ach, males with high n power, and males with moderately complex cognitive styles.

Summary. The major conclusions from the perceptual measures of feedback are (1) that to the extent they discriminate between simulation and case, they indicate that case students perceive more feedback; (2) that such perceptions are confined almost exclusively to male groups; (3) that these differences among males are associated with differences in motivations toward achievement, affiliation, and power, with those who are high on these needs frequently differing in their perceptions of feedback from those who are low. (The reader is referred again to Table 11.1.)

Behavioral measures of feedback

To measure feedback objectively we stationed Observers in each of the experimental sections. They recorded the amount of reinforcement given to each student by the instructor and other students. They also recorded the frequency with which each student participated in the activities of his section. In addition, they coded each feedback as either positive or negative.* From these data three ratios were constructed: participation to to feedback, positive feedback to negative feedback, and student feedback to instructor feedback. We shall now report data on each of these ratios with respect to differences between case and simulation sections.

Ratio of participation to feedback. This ratio is constructed from data on the amount of feedback or reinforcement given each student by both the instructor and other students and from the frequency with which each student participated in the activities of his section. A ratio of these two frequencies provides a general index of reinforcement or feedback which controls for variations in frequency of participation. The lower the ratio, the greater the reinforcement per participation; the higher the ratio, the less the reinforcement per participation. Table 20.1 shows the mean scores of this ratio for individuals in simulation sections and case sections; the difference between means is statistically significant, indicating that case sections provide greater reinforcement per participation than simulation sections.

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*See Appendix A for the observation form.

Table 20.1

The Ratio Of Feedback To Participation Is Greater In Case Than In Simulation

Mean Ratio of Feedback to Participation		
	Simulation	3.0366
	Case	1.8984
Difference		1.1382, significant at .05 level as determined by t test

Similar results are obtained for most other groups, including all males and all females.

Ratio of positive feedback to negative feedback. This measure is constructed from Observers' coding of each reinforcement as either positive or negative. The lower the ratio, the greater the negative feedback per positive feedback. No differences were found between the mean ratio for any of the 23 groups.

Ratio of student feedback to instructor feedback. This ratio was constructed from Observers' data on frequency of the source of feedback, whether instructor or student. Simulation students receive much more feedback from students than from instructors; case students receive slightly more feedback from instructors than from students. The data are displayed in Table 21.1.

Table 21.1

The Ratio Of Student Feedback To Instructor Feedback Is Higher In Simulation Than In Case*

Mean Ratio	
Simulation	11.24
Case	.17
Difference	11.07, significant at .05 level as determined by t test

*A ratio of 1 would indicate an equal amount of student and instructor feedback. A ratio greater than 1 indicates relatively more student than instructor feedback. A ratio less than 1 indicates relatively more instructor than student feedback.

Summary. The major conclusions from the behavioral measures of feedback are (1) that feedback is not unidimensional; (2) that simulation provides much much more total feedback than case; (3) that simulation feedback is largely student feedback; and (4) that case feedback is largely instructor feedback.

Explicitness

Freudian psychology and psychoanalysis have emphasized the value of rendering the implicit explicit. Individuals are believed to cope with their personal problems more adequately when they understand clearly the sources of the problems. Businessmen, teachers, and doctors supposedly improve their performances by receiving observations of their work and engaging in detailed discussions of their procedures, thus increasing the extent to which they are aware of their own activities. In short, the hypothesis is that explicitness or awareness of one's position, role, problem, job, or situation improves one's performance.

Simulation and games have been said to make participants more explicit about what they are doing, seeing, or hearing. Students are then led to interpret their activities in terms of concepts and principles discussed in other course materials. Explicitness may be defined as the capacity to identify consciously elements of a problem in an analytic or technical sense. This skill is more than "knowing" that there is an abstract quality or object and more also than being able to define a term or concept. It is not merely having a "feel" for a situation in the sense of experiencing insight through a sudden surprise or an "ah-ha" experience. It is the conscious recognition that a particular experience falls in a certain class of phenomena; it is recognizing the analogy between event A and class M. It is the skill of identifying an object in a context and being able to give it its technical label, which throws the object open to interpretation in terms of the principles associated with it.

For example, in the course on Administrative Process, one of the characteristics of organization behavior which is taught is "satisficing."

To satisfice is to adopt the first solution or alternative which seems "good enough" to solve one's problem or decision; it is less "rational" than the optimal decision postulated by classical theories of economic and organizational decision-making, but it is also more typical and descriptive of human activity. Lectures or case materials may identify and stress this fact of decision behavior, and students may be able to define the term, match it with its definition in a list of definitions, or regurgitate it in an essay examination. But beyond this, one object of teaching is to help the student discover such behavior in its rich, manifold context.

Explicitness is admittedly a difficult variable to operationalize. Generally, we had in mind the quality plus the quantity of students' reason-giving in choice situations. We sought to measure this by attaching follow-up questions to the principles part of the examination. These questions asked students to give their reasons for selecting the alternative they chose on multiple choice items. These were graded by two persons and a mean score assigned. Inter-score correlations were .87 for American Foreign Policy, .94 and .82 for International Relations, and .68 and .75 for Administrative Process.

We observe virtually no difference between simulation and case students' performance on the explicitness measure. Only one of the 23 groups evidenced statistically significant differences between simulation and case. That group consisted of males with moderately complex cognitive style; these males in case section did significantly better on explicitness than did their counterparts in simulation. However, we attach little substantive significance to this one statistically significant difference. Although it runs counter to our hypothesis that simulation would promote explicitness, it is the only group showing case students more explicit.

More important than this one isolated group is the general direction of the data on explicitness, namely that the case study does about as well as simulation in promoting or not promoting explicitness.

Learning Outcomes

The most fundamental reason for studying teaching methods is to determine what methods under what conditions favorably affect student learning. If different methods do not have different effects, one can leave to taste and cost the selection of one method instead of another. But if for some kinds of students one method seems more effective for learning than another, there is a presumption in favor of the adoption of that method, assuming cost and other factors are equal.

We undertook to measure student performance for two kinds of learning, mastery of factual materials and understanding of principles. For each course, we administered equivalent tests for fact-mastery and principles at the beginning of the quarter and again at the end. The pretest-posttest design allows us to undertake analysis of covariance to determine whether teaching method is related to changes in learning during the course rather than rely only on differences in performance on the final exams.

Fact-mastery questions were objectively scoreable instruments. For American Foreign Policy, the examination was constructed from items given to students (N = 22) in the 1962 Northwestern Summer Session course following the completion of their classwork. Items were selected which differentiated between the high and low performers. From these items the equivalent pre- and post-course examinations for fact-mastery were constructed.

For International Relations, the Cooperative Test on Foreign Affairs, developed by the Educational Testing Service, was used to measure fact-mastery.[28]

For Administrative Process, potential questions were written from the course materials and administered to more than 200 students at Washington University of St. Louis, Georgetown University, and Douglass College, Rutgers.

Principles examinations were of two kinds. The first was an objective exam, mostly of multiple choice questions but with some true-false items, which was constructed for American Foreign Policy and International Relations. For the former, pretesting was carried out in the same summer course used for work on the fact-mastery questions; for the latter, items were submitted to a team of graduate students and faculty in International Relations and judged for appropriate difficulty. For Administrative Process, objectively scoreable principles questions were taken from a test prepared by the Center for Programs in Government Administration of University College, University of Chicago. The items were designed and selected by a panel of five judges, instructors in administration, for a Summer Institute in Executive Development for Federal Administrators.[29]

The second type of principles examination was an essay. The essay was scored by at least two graders. Intercorrelations for American Foreign Policy were .78 for Part I, .90 for Part II; for International Relations, .75; for Administrative Process, .72. These questions, unlike fact-mastery and the other principles items, were administered only at the end of the courses.

We had predicted better performance on both fact-mastery and principles by simulation sections and expected that any exceptions to this generalization would be by particular personality groups. However, an analysis of covariance revealed no statistically significant differences between simulation and case for any of the 23 groups in respect to fact-mastery. The same was true of all groups on the objective part of the principles examination. That is, no statistically significant difference in pre- and post-test performance was evidenced for any of the groups. Virtually the same finding held for performance on the essay part of the examination; only one group, males with low n aff, did significantly better in simulation than in case, on the principles essay.

In short, simulation and case hardly differ in their relation to performance on these two learning outcomes, fact-mastery and understanding of principles. If simulation and case differ at all, assuming internal validity of our procedures, the differences are complex and indirect. No simple and direct associations between method and learning were found. We turn now to considering interest and feedback as intervening variables, which when controlled for, might mediate the indirect influence of simulation or cases.

Interest and learning outcomes

To see whether interest intervenes between method and learning, we shall consider the four interest measures which discriminated between simulation and case (see Table 1.1, Columns E, H, I, and J). These are the perceptual measure of lab preference and the behavioral measures of attendance, Course Evaluation, and rate of participation.

Table 22.1 displays the mean improvement on the two learning variables for males and females according to whether they preferred their own section or the opposite one.

Table 22.1

Those Who Prefer The Other Lab Section
Tend To Improve More

	N	Mean Pre-Post Improvement Fact-Mastery	Principles
Males in Case Preferring Case	30	9.5667	8.3333
Females in Case Preferring Case	18	11.3333	9.5556
Males in Simulation Preferring Simulation	31	11.0323	11.4184
Females in Simulation Preferring Simulation	13	4.8462	7.2308
Males in Case Preferring Simulation	12	9.6667	14.5833
Females in Case Preferring Simulation	3	4.0000	17.0000
Males in Simulation Preferring Case	16	13.5625	7.0625
Females in Simulation Preferring Case	11	18.9091	14.6364

In all but one group, those who preferred the other lab section did better on fact-mastery, i.e., showed more mean improvement between the pre- and post-course scores, than did those who preferred their own lab. (The one exception was females in case section, and for this group, those girls did better who preferred their own lab; however, the N of those who preferred simulation was quite small, 3.) The differences in mean improvements were not great between those who disliked and liked their own labs, except for females in simulation. In that group, those eleven who preferred case had a mean of 18.9091 compared to a mean of 4.8462 for the thirteen who preferred to stay in simulation.

In addition to revealing a general difference between students who preferred their own lab and those who preferred the other, Table 22.1 also indicates a difference between students preferring case and students preferring simulation regardless of the section they were actually in. Taking each of the four groups (i.e., males in simulation, females in simulation, males in case, and females in case), we observe that in three of the four groups the mean pre-post test improvement was greater for students who preferred case.

When we turn to the relation of lab preference to principles learning, we see the same kind of relation noted between lab preference and fact-mastery. That is, except for one group, males in simulation, those who preferred the other lab did better, i.e., showed more mean improvement between the pre- and post-course examinations.

However, the relation between object of preference and learning of principles is just the opposite of that between object of preference and fact-mastery. In three of four groups, students who preferred simulation did better.

Now we take up the behavioral measure of interest as expressed by attendance and its relation to fact-mastery and principles learning. Table 22.2 reports the correlations between fact-mastery and principles learning and rate of attendance for males and females in case and simulation.

Table 22.2

Correlations Between Attendance And Fact-Mastery And Principles Learning For Males And Females In Case And Simulation

	Fact-Mastery	Principles
Case Males	—.3023	.1182
Case Females	—.3553	.0412
Simulation Males	—.0345	.1632
Simulation Females	.1164	.2441

Although none of the correlations is large, two points stand out. First, for three of the groups there is a negative correlation between attendance and fact-mastery, but all the correlations between attendance and principles learning are positive. Second, the high positive correlations between attendance and learning are for simulation males and simulation females.

We come now to the behavioral measure, Course Evaluation essay, and here we have findings reminiscent of those on the perceptual measure of lab preference, in which those who preferred the opposite lab did better than those who preferred their own. Table 22.3 displays mean improvement scores for both males and females by section and according to whether they positively or negatively evaluated the course. In all groups, negative evaluators have higher mean improvement on fact-mastery than positive evaluators, although this is significant only for simulation males. Likewise, in all groups, negative evaluators show a higher mean improvement on principles than do positive evaluators, but none of these differences are significant.

Table 22.3

Those Who Evaluate Their Section Negatively Tend To Improve More

	N	Mean Pre-Post Improvement	
		Fact-Mastery	Principles
Case Males, Positive Evaluation	6	7.0000	5.3333
Case Males, Negative Evaluation	9	10.0000	9.8889
Case Females, Positive Evaluation	5	11.2000	0.0000
Case Females, Negative Evaluation	9	15.7778	14.1111
Simulation Males, Positive Evaluation	10	4.7000*	6.9000
Simulation Males, Negative Evaluation	12	16.6667*	13.9167
Simulation Females, Positive Evaluation	5	1.4000	9.8000
Simulation Females, Negative Evaluation	8	4.1250	13.5000

* The differences between these means is significant at .05 level as determined by t test.

Next we consider rate of participation as an interest measure intervening between method and learning. Table 22.4 reports correlations between fact-mastery and principles and rate of participation for males and females in case and simulation. Notable in these data are the relatively low correlations, with only two of the eight higher than .3. Moreover, five of the eight are negative correlations, and simulation males are the only group with positive correlations between rate of participation and both fact-mastery and principles.

Table 22.4

Correlations Between Fact-Mastery And Principles Learning And Rate Of Participation For Males And Females In Case And Simulation

	Fact-Mastery	Principles
Case Males	—.1106	—.2771
Case Females	.0489	—.0160
Simulation Males	.3273	.2288
Simulation Females	—.1909	—.4786

Feedback and learning outcomes

Table 11.1 shows that two of our feedback measures significantly discriminate case and simulation students. These are "rate of participation to feedback" and "rate of student to instructor feedback." We now relate these two variables to fact-mastery and principles learning in the same manner as we did the interest variables discussed in the previous section; correlations are displayed in Table 23.1.

Table 23.1

Correlations Between Fact-Mastery And Principles Learning And Rate Of Participation To Feedback For Males And Females In Case And Simulation

	Fact-Mastery	Principles
Case Males	—.3585	—.1541
Case Females	—.0548	.0069
Simulation Males	—.3351	—.2360
Simulation Females	.2567	.0989

Two observations are noteworthy. First, observe the presence of negative correlations. In five groups learning appears to be inversely related to amount of feedback. Second, note the sex related difference between the positive and negative correlations. For males the relationship of learning and feedback is negative for all groups. All the positive correlations occur among females. For them, all but one correlation is positive.

Table 23.2 reveals a general and positive relationship between learning and student feedback. In only one instance -- case males on principles -- is this not true. Here we see a negative but low correlation. In all other instances, the relationship is positive.

Table 23.2

Correlations Between Fact-Mastery And Principles Learning
And The Ratio Of Student To Instructor Feedback

	Fact-Mastery	Principles
Case Males	.2318	— .0386
Case Females	.3172	.2829
Simulation Males	.3406	.2692
Simulation Females	.1757	.1127

A sex related difference is also suggested by the table. In the case section, the correlations between learning and student feedback are greater for the females. The reverse is true of simulation. Here the relationship is relatively greater for the males.

Summary

The relations between simulation and learning outcomes may be summarized in the following propositions. (1) There is no direct and unmediated relation between simulation and fact-mastery or principles learning. However, a number of indirect, rather complex relations were observed. (2) Those who preferred the other lab section did better on fact-mastery and principles, i.e., they showed more mean improvement between pre- and post-course scores. (3) In general, those who preferred case, regardless whether they were in case or simulation, did better on fact-mastery. (4) However, those who preferred simulation, regardless of section, seemed to do better on principles. (5) Attendance and fact-mastery were negatively correlated, but attendance and principles learning correlated positively. (6) The high positive correlations between attendance and principles were among simulation students rather than case. (7) Negative evaluators had higher mean improvement on fact-mastery than positive evaluators, especially among males in simulation. (8) In general, participation and learning correlated negatively. (9) The strongest relation between participation and learning was among males in simulation. (10) Feedback seemed to correlate negatively with learning, especially among males, but student feedback was positively related to learning, (13) with a stronger relation among simulation students than case, and (14) among men than women.

Conclusions and Implications

This section will not include a lengthy summary of our technical findings. These are stated explicitly throughout the body of the report, in the titles of tables, and at the end of each section. Instead, our purpose here will be to offer qualitative conclusions and call attention to some implications for research and policy.

In general, the claims and expectations we had for simulation have not been borne out. It is not uniformly superior to case studies as a supplementary teaching activity, nor are the exceptions to this generalization quite as we predicted. We expected more differences between personality groups than were found. Nevertheless, the somewhat pessimistic conclusions from the data should not obscure two important findings, namely, that behavioral measures of interest reveal simulation to be more involving and interesting than case studies and that simulation offers much more student-to-student feedback than case discussion sections.

Both these observations are similar to findings from another recent experimental study of games.[30] It must be remembered that there is very little empirical evaluation of games and simulation, so it is a sparse literature to which our results are relevant. In four Baltimore high schools, James S. Coleman and Sarane S. Boocock have studied the use of an election simulation (by computer) in two schools and the non-use in two others. They find, even more than do we, that the game excites interests and motivates students on virtually every measure of interest. Nothing comparable was found in the control schools without the game.

In addition, their work suggests the importance of a feedback source other than the teacher. In high school courses, but perhaps to a lesser extent in colleges, the instructor is both a symbol of authority on non-educational matters and a judge of educational progress. Observers of graduate education have commented on the fact that graduate students appear to teach each other far more than professors teach students. The graduate student sub-culture is peculiarly organized to provide student-to-student feedback. Simulation and games appear to introduce something of this process into high school and college courses.

In spite of these claims for differences in simulation and cases or other materials, the "so what?" question remains: what differences do the differences make for learning? We have pointed out in the section on learning outcomes some differences, but they are usually small. Yet these are differences obtained from small differences in treatment. Virtually everything in the courses was the same for both groups, except for their three-hour laboratory periods held on one afternoon each week. And the number of "treatments" with case and simulation were only eight or nine during an academic quarter.

Moreover, the subjects in this experiment were college students, many of them already interested enough in politics to be political science majors and/or to recruit themselves into these courses. It is important to bear this in mind in assessing the implications of the small differences obtained from this experiment. If there is anything we know from modern studies of political socialization, it is that political interests and skills are often acquired early, by adolescence, and are not much altered except by dramatic social events or traumatic personal deprivations.[31] Thus, any differences at all may be regarded as socially and theoretically significant.

We conclude with a discussion of a number of significant conclusions from this research. The Northwestern Inter-Nation Simulation is only one member of a class of generically similar exercises applied to a range of disciplines and problems, a fact which constitutes an important attribute of the context of our study. Equally important is the fact that a plunge into the complexities of controlled experimentation of the sort we undertook throws additional light on several fundamental issues associated with nearly all teaching techniques and situations. To be sure, the expense, time, and skills attendant upon the proper use of the INS made it necessary to isolate its peculiar contributions (if any) when compared to what might be for some practitioners competing alternatives. But we found that to face our challenge seriously involved us in old, yet unsettled, educational questions and in learning research lying far outside political science. We shall mention several of these briefly because they are a significant aspect of the context of current and future experiments. Like anyone else who has been moved to rigorous inquiry by general concerns, we found a constant tension between what we wanted to know and what we could build into a feasible design given limitations of time and money.

Beyond facts and principles, what? The learning of principles and the mastery of facts central to the course content covered in this experiment were two of the six dependent variables on which we predicted we would find differential performance by students exposed to the case method and to simulation. Not to have included these variables, of course, would not have made sense, but in view of the well-known attrition by fading memories, we find ourselves asking: what remains one or two or more years after a final examination in a course? Is there some intellectual property "X," separate from the grasp of facts and principles, for which we ought to be searching -- some way of identifying and measuring an increase in "intellectual power" which might endure on a self-generating basis? Is it meaningful to speak of an irreversible learning capacity which might be triggered by certain educational experiences and not others?

If, indeed, nothing apart from facts and principles does endure, if much of what is taught or learned perishes relatively quickly, then the expense and anguish of measurement of differential effects of various instructional techniques seems misplaced. If, on the other hand, an unspecified quality does, or is expected to, become part of the individual's continuing learning, then something crucial will be omitted from the evaluation of learning effects produced by antecedent conditions manipulated by teachers and researchers.

A haunting suspicion that, excepting skills (in the usual meaning), values, and attitudes, we may not know what the residual or generative impact of a liberal education is for individuals or aggregates of individuals is doubtless not confined to us. The problem can be made trivial by saying that it is impossible to construct a sentence which states a testable proposition. Moreover, it is not very difficult to think up "abilities" and then devise operational measures for them. Or, on technical grounds, one can acknowledge that longitudinal studies which carry carefully selected panels of experimental subjects through periodic observation and testing is expensive and fraught with unforeseeable frustrations. Finally, the questions raised above certainly point to an extensive literature on problem-solving, critical thinking, and higher mental processes, in which conceptualization and validated instruments abound and are available for borrowing and adaptation.

Somehow we are left unsatisfied by these clearly pertinent considerations. Researchers do not lightly proliferate dependent variables especially when each one adds a burden to the design. So it was in this case. Posttesting later in time, which would have permitted some tentative conclusions regarding retention or persistence of learning, was not possible. Nonetheless, our experience with this project has underscored elements which deserve high priority in the next stage of a long-range study.

As we explain in the main body of the technical report, we had to abandon a variable originally built into our design, namely, empathy, a conceptually slippery factor which appears significant, if closing the gap between students entering a complex policy and official decision-makers is a worthwhile educational objective. The weight of respected opinion in psychology is not optimistic regarding this variable. Before accepting defeat on a matter which seems intuitively so important, we believe there are good reasons for further effort:

1. One recent study suggests operational definition and measurement may not be insoluble problems.[32]

2. Work in the general domain of "sensitivity training,"[33] may have adaptable applications to the simulation mode of instruction.

3. There is a highly interesting hypothesis which states that moderate motivation correlates positively with efficient performance on complex tasks, with perceptual objectivity and with accurate judgment in general. Beginning with the early work of Yerkes and Dodson (1908) and coming down to recent studies by Bruner, Birch, and Berlew, there seems to be fairly consistent support for this hypothesis. Three variables used -- task competence, influence, and affection -- correspond to our three personality variables of need-achievement, need for power, and need for affiliation.

4. If it is true that moderate motivation facilitates generic or rule learning,[34] then it might be feasible to test a rule

which seems closely related to the general notion of empathy: as much knowledge as possible before judgment. Since simulation is intended to give the student a vicarious policy-making experience, three questions might be used for testing: (a) how much of what kind of knowledge would one need about a decision or a decision-maker before one would judge it or him? (b) what kinds of criteria of judgment would a certain decision role entail or a decision-maker in typical situation regard as binding? (c) what would one envisage a decision-maker's definition of the situation to be in particular kinds of instances?

We suspect that the property of empathy has a combined fact-value or cognitive-affective component which must be clarified analytically for the purposes of training future citizen-judges for the performance of various political roles and for desirable involvement in political participation. What is the general knowledge factor we seek? What are the bases of sound judgment of the rightness or correctness of public policy decisions (and decision-making)? Apathy (low motivation or interest) is generally regarded as "bad," and commitment or high participation (high motivation or interest) is generally regarded as "good." However, it may be that high motivation implies the precedence of value over fact, while low motivation implies felt ignorance which inhibits value judgment. In any case, the three degrees of motivation -- high, low, and moderate -- should be independent variables in simulation training to discover whether and how the intervening vicarious experience affects some measure of empathy.

In addition to empathy, or perhaps ultimately and intimately bound up with it, are "learning to learn" and "relational thinking," factors we could not deal with in the present study, but which seem relevant to our search for an enduring intellectual capability which might conceivably be trained or triggered by simulation procedures designed with this intention in mind. We realize that simulation is (and should be) only one type of instruction, and we are also aware of the possible adverse effect of an eight to ten week exposure in one course to an experience from which we expect so much. Nevertheless, to dramatize what may be an impossible task, we think it useful to reformulate the questions listed above into a single problem: assuming attrition of facts and principles, can we prepare future citizens for future problem-solving, for redefining familiar problems, for structuring new problems so as to maximize the number of possible solutions and to avoid fixation of definition, for asking questions not previously asked, for avoiding premature judgment, for employing alternative frameworks for interpreting others' behavior, and for living with uncertainty? To take just a single facet of this, can individuals be trained, or train themselves, to derive fresh insights from a sudden shift in the way a problem is viewed?

The foregoing is at best a preliminary skirmish. However, assuming we might eventually be able to identify an intellectual quality "X," we should now try to ascertain what differential effects, if any, are associated with the participative, nondirective, and partially non-verbal intellectual experience which is embodied in simulation.

Transfer of learning. Whenever we talk about the relationship between an educational experience at Time_1 and the behavior of an individual at Time_t, it is patently obvious that we confront the fifty-year-old issue of the transfer of learning. Phenomena implied by the phrase are related to, yet different from, the problem outlined immediately above. To discuss this complicated issue as experts is beyond our competence, but mention of it belongs in an overview of our experiment because we feel a responsibility to ask if, within what we do in certain political science courses, there are elements which are transferable to other arenas and situations, including other courses, personal problems, and later political observation and experience. In what ways are our techniques of presentation related to transferability? The link to the quality "X" already discussed lies in the possibility of a more general decision-making (or problem-solving) capability which might be established and reinforced during formal education. Yet the transferability issue also bears directly on the learning and later application of principles, and, hence, on the problem of retention.

Our dedication to explicitness both as a dependent variable in the experiment and as a norm to guide our activity as teachers, impels us to inquire into our patterns of presenting principles. The chances are we use an implicit "mix" of the three classic patterns: (a) the teacher states the result of an application of principle; (b) the teacher states only a principle; and (c) the teacher applies the principle by example. The design of the simulation vs. case study learning effects does not, unfortunately, permit us to differentiate these patterns in interpreting our results -- a fact which may account in part for some of our "no difference" findings.

The extension of future experiments in this direction is justified, among other things, on the basis of a research finding: independently derived principles are more transferable than those in which the principle is given to the student.[35] Clearly there is a long distance between the kinds of problem-solving and transfer of learning experiments which psychologists typically perform and the questions of concern to us as political scientists. Needless to say, new experiments will be needed which incorporate those independent variables which are hypothesized to cause systematic variation in problem-solving behavior and which focus on positive transfer -- all with a content related to (or relatable to) political analysis and political decision-making. While this is a very large order indeed, a start can be made by testing our hunch that since the student projects onto a completed story under the case method and into an unfolding situation under the simulation method, the transfer value from the latter may be greater. In other words, simulation can be viewed as an exercise in undirected problem-solving, whereas the case may be presented either as a concrete example from which principles can be inductively derived, or as an object to which already stated principles can be applied. Our results show greater feedback for the case method students than simulation students, but it is well to note that the feedback is from interaction with the instructor and fellow students in discussing interpretations of the case, not from an encounter with a situation requiring action.

A recent reformulation of Harlow's conceptualization of "learning to learn" in terms of the acquisition of a single class of habits to a complex set of cues[36] strikes us as heuristically relevant to our problem of deciding what it is that we can give a future citizen which will transcend changes in headlines and cut across a range of different stimuli. It seems to us that if we are to explore the transferability issue in the context of our subject-matter, the political scientist will have to help specify the stimulus properties of various types of political situations and problems.

Adolescent society and public affairs learning. Unless teachers and researchers are content merely to conduct neat experiments on severely limited topics, we are bound to be affected by cumulative findings and reassessments which can be found in such books as The Adolescent Society, The American College, The Adolescent Citizen, What College Students Think, Handbook of Research on Teaching, Education and the New America, The Socialization of the Child, and many others.[37]

This is not the place to set forth the empirically substantiated propositions about processes of socialization and adolescent behavior in American society which are relevant to our objectives as teachers of politics and government. But we can scarcely avoid reference to the almost banal, yet persistent, problem of student motivation. McKeachie and others have rigorously established that orientations toward values are related to the impact of the educational process. What is not known, so far as we know, is how political values and beliefs affect attitude change and knowledge acquisition in political science courses, or how non-political factors (e.g., cognitive style) affect the learning of analytic skills and empirical theory.

From our point of view, the following propositions seem tenable enough to be taken seriously:

(1) values and attitudes change relatively little or very slowly as a result of exhortation or reading

(2) political values and attitudes are acquired fairly early in childhood

(3) adolescents have a variety of political experiences in groups and organizational or structured situations, but these are rarely so perceived

(4) purely passive intellectual activities do not offer satisfying outlets for the high energy potential of young people; peer group interaction is predominantly social rather than individual

(5) adolescents seldom have opportunity for playing (realistically) more than one type of social role

(6) the world of the young student is confined, is "in here," meaning the school or peer group activity, whereas the world of politics is "out there"

(7) generally speaking, young students do not have a chance to apply what they learn in the "social studies"

(8) from (6) and (7) past learning about politics is likely to lead to models of either an idealized sort or a realist-pessimistic sort

(9) there is evidence that student-centered learning is more effective under certain conditions

(10) an educational environment or experience which is discontinuous for the individual is likely to produce readiness for change or more change itself

(11) the discrepancy in measurements of I.Q. and creativity indicators suggest the need for more opportunities to express the latter

(12) interpersonal competition (i.e., grades) is a negative value, but intergroup competition is a positive value

These are some of the reasons for believing that traditional methods of presenting subject-matter might be reexamined profitably -- reexamined, not necessarily abandoned. In particular, simulation -- in as yet undeveloped ways -- may offer a relatively rich set of possibilities for accommodating the above conditions. We presented an adequate rationale for including the motivational variables we did, but a reliable answer to the question of the qualitative difference simulation may make to learning will depend on our prior identification and testing of motivational factors suggested by a wide range of recent researches. Simulation has been technically advanced to the point at which political units and decisional structures can be reproduced in ways which could render the past experience of the student explicit, provide him with a chance to come to grips with environmental diversity, and enable him to engage in group problem-solving with his peers.

We think our results contribute to strengthening the consensus mentioned earlier regarding interest stimulation via simulation despite inconclusive findings on some items. The finding that objective indicators of interest were in favor of simulation, while subjective indicators showed no difference between simulation and case or preferences for case is most intriguing.

Moreover, the several findings of male-female differences in learning raises more general questions about effects under differing antecedent treatments.

Political education in a free society. That there is widespread disillusionment with "teaching" democratic values and widespread criticism of "civics" courses as adequate for "good" citizenship need no proof here. The heart of what we wish to say in connection with an experimental program can be inferred from these questions: what individual characteristics, presumably learnable or trainable in some sense, would be functional for a pluralistic, self-determining society? In addition to minimum factual knowledge of how our system operates to realize its values, what skills or orientations are "functional requisites" of democracy? These are ancient queries, of course, and transcend our society's concerns. We believe that it is part of one's responsibility as educators to reconsider the role of popular intelligence in making democratic politics work.

Despite the intimate historical connection between American democratic thought and theories of education,[38] the questions raised above do not seem to have been faced head-on by the academic community as a whole, nor are many directly relevant research projects currently underway. Individual political scientists -- Lasswell, Lane, and Davies, for example -- have related personality attributes and forms of political behavior. Yet this work does not always probe the effects of educational content and procedures on maintenance criteria of our system beyond significant, but scarcely exhaustive, elements such as respect for civil rights, participation in elections, and so on. The American Political Science Association is only just beginning to get involved with secondary education in government and how it presently compares with the best the discipline has to offer. It seems clear that the twin factors of (a) a strong tendency to regard the teaching of politics as highly sensitive, and (b) the pervasive influence of rapid social change, have produced an increasing bind on forces pressing for reexamination.

It would be foolhardy indeed to gloss over the complexities of this meta-problem. However, we can suggest briefly why it is part of the context of the experiment reported above. Running a deliberate risk of oversimplification, and assuming what follows is only a means of illustrating the need to cut through to certain critical variables in the learning situation, we can postulate three selected characteristics of "the democratic personality." First, we return to empathy, broadening it now to include, along with taking the role of the other (e.g., policy-makers), acceptance of the fact that others are different, not just acceptance or rejection of values which may be strange or repugnant -- essentially a non-judgmental orientation unless and until a real issue arises. Inherent in this conception is an ability or willingness to project one's self imaginatively into another's view of the world or into unfamiliar situations.

Second, a capacity to accept and deal with changes in self, society, and in any sector of the operating environment. This implies a willingness and ability to adopt new points of view, to innovate social and individual ways of achieving common interests, and to change one's convictions if circumstances warrant. The norm suggested is the same open-mindedness toward political values and interests that science requires toward evidence. Third, a knowledge or empirical component would consist of a theoretical framework for understanding how various social and political systems and processes function, an awareness of causality and of what conceivable means and ends chains might affect alternative solutions, and the ability to apply general principles or values to particular factual situations.

With reference to a subject-matter -- say, all courses in government and politics -- we would suggest that learning ought to contribute to the establishment or strengthening of three capabilities: to empathize, to deal with change, and to be able to make sense of the world empirically with the knowledge one possesses or to identify needed knowledge in case of uncertainty. Obviously we have not operationalized these characteristics into dependent variable measures. Tools for doing so exist for the second and third, though adaptation will surely be necessary.

Perhaps it is noteworthy that the empathy variable ties into much work on perceptual and judgmental accuracy, the second relates to work on cognitive flexibility, orientation to the future, and convergent-divergent thinking, and the third points to the ingredients of structure and transferability in learning experiments. All three can be grounded in observations of democratic political life -- the plurality of competing interests and the consequences of individual and group differences, the constant flux of interests and attitudes caused by social change and pressing on problem-solving institutions, and the importance of processes of determining relevant political and social facts and causal theories.

Experience with this project convinces us that, as we move ahead through succeeding researches, it will be necessary: (1) to look at political science from a more holistic point of view in order to decide among alternative structurings of our present state of knowledge; (2) to clarify the range of different instructional approaches and project for each its differential effects; (3) to specify the intervening factors which may condition effects; and (4) to array dependent variables -- learning effects -- which are explicitly derived from values and goals assumed to be educationally and politically important.

To be this ambitious is not to entertain unrealistic aspirations. Without looking at the problem this way, limited steps will be less portentous than they otherwise might.

Examinations and testing. The Pandora's box we have elected to open may necessitate a new perspective on our traditional practices in assessing intellectual accomplishment. We are hardly experts in testing, and the reservoir of instruments grows almost exponentially. On the other hand, we think we must ask ourselves whether, given the variables we are interested in, and given the no-significant-differences phenomenon, a different kind of examination or different instruments must be devised. Research of the type reported here is nearly always haunted by the prospect that (a) something not taught or learned is subjected to measurement, or (b) something taught or learned is not represented in the instruments used.

We put simulation up against the stiffest possible competitive test -- partly, we suppose, to compensate for our enthusiasm. We suspect that we have not yet identified all the performance qualities we expect to be most influenced by the simulation experience -- for example, application of principles, empathy, or decision-making capability. Moreover, the familiar conflict between essay-type examinations and the objective multiple-choice test strikes us as having obscured the possibility of a third kind of solution. The essay still suffers from difficulty of content analysis for certain kinds of variables and from severe problems of inter-grader reliability. The usual objective form is most suitable only for fact-mastery. We are aware that ETS has developed a cognitive preference test for physics which looks promising for some of our purposes -- particularly with reference to application of principles. At this moment we are unsure what a similar one for political science would look like. We feel we have made progress in devising content instruments, but we recommend exploring a political problem-solving, or decision-making, exercise modeled after Christine McGuire's test for skill in medical diagnosis. Step-by-step feedback is built into such tests, thus providing branch points and results instead of a one shot, right or wrong result or a sleazy product which is subject to a wide variation in judgment.

Finally, we believe it essential to discover whether we can invent ways for the student to evaluate his own intellectual progress. The fact that some tests can be self-administered successfully encourages us to believe that another grading burden may be avoidable. In any case, the continuity of simulation -- the development of a simulated world through nine weeks -- offers an opportunity for the student to ascertain and evaluate changes in his attitudes, perceptions, skills, felt control, and theoretical understanding. A comparison of results on a standardized self-evaluation instrument in simulation and case method courses might yield interesting differences. Above all, we might learn whether lack of perceived progress on tasks controllable by the student is a factor in the degree of involvement in the subject.[39]

APPENDIX A

Date ______________
Course ____________
Observer __________

SIMULATION CONFERENCE OBSERVER FORM

STUDENTS	TIMES SPEAK	FEEDBACK
		+: -: N:
		+: -: N:
		+: -: N:
		+: -: N:
		+: -: N:
		+: -: N:
		+: -: N:
		+: -: N:
		+: -: N:
		+: -: N:
		+: -: N:
		+: -: N:
		+: -: N:
		+: -: N:
		+: -: N:

Date ______________
Course _____________
Observer ____________

STUDENTS	PRESENT	TARDY	RAISED HAND	CALLED BY NAME	USED EXAMPLE	NAMES BOOK	LEAVES EARLY	REMAINS LATE

APPENDIX B

COURSE EVALUATION

I. In items 1-10 choose the alternative which best fits your attitude on the subject in question. Mark your selection by checking one of the alternatives. If you have difficulty making a judgment on any item(s), make the best choice you can and note the source of the difficulty in the margin. When the word "class" is used in these items it means both lecture and lab periods.

1. Did your instructor in this course often use the work (reports, statements, questions, etc.) of students in the class as basis for class discussions?

___1. Yes, he did this in frequent class sessions.
___2. Yes, he did this in occasional class sessions.
___3. He did this in rare class sessions.
___4. He never did this.

If you answered other than number 4 above, were you one of the students whose work was used in this way?

Yes_____ No_____

Was your work used:

Favorably_________ Unfavorably_________

2. Did your instructor ever criticize students in class?

___1. Yes, he did this frequently.
___2. He occasionally did this.
___3. He rarely did this.
___4. He never did this.

If you answered other than number 4 above, were you one of the students who was criticized?

Yes_____ No_____

Did you feel that this criticism of you was excessive?

Yes_____ No_____

3. Did your instructor "depersonalize" his criticism of students' work, making it clear that he was criticizing the ideas expressed, but not the person expressing them?

___1. Yes, he frequently did this.
___2. He occasionally did this.
___3. He rarely did this.
___4. He never did this.

Were you criticized in this manner?

Yes_____ No_____

4. Did your instructor express approval of the contributions of students?

___1. Yes, frequently.
___2. Occasionally
___3. Rarely
___4. Never

If you answered other than number 4, were you one of the students whose contributions received approval?

Yes_____ No_____

5. To what extent would you say your interest in American foreign policy has been stimulated as a direct result of this course?

___1. It has been stimulated quite a bit.
___2. It has been somewhat stimulated.
___3. It has been slightly stimulated.
___4. It has not been stimulated at all.

6. To what extent would you say that your interest in political science in general has been stimulated as a direct result of this course?

___1. It has been stimulated quite a bit.
___2. It has been somewhat stimulated.
___3. It has been slightly stimulated.
___4. It has not been stimulated at all.

7. Do you plan to take more courses in political science?

___1. Yes, I am definitely planning to.
___2. I am considering it.
___3. I doubt if I will take more courses.
___4. I definitely will not take more courses.

If you do plan to take more courses, which ones would you like to take?

____

____

____

8. Do you find that you do more general reading on American foreign policy (aside from reading required for class work)now, than you did at the start of the semester?

___1. Yes, a great deal more.
___2. Yes, somewhat more.
___3. No, about the same.
___4. No, I do less now.

9. Do you feel that you have learned much factual information from this course?

___1. Yes, quite a bit.
___2. A fair amount.
___3. A small amount.
___4. Very little.

10. Do you feel that you have gained a general understanding of important principles in American foreign policy from this course?

___1. Yes, my understanding has increased a good deal.
___2. My understanding has increased somewhat.
___3. My understanding has increased slightly.
___4. My understanding has not increased at all.

II. In the rest of the items in this evaluation form the method of response is indicated separately.

11. Estimate the amount of time (if any) per week you use the following media as sources for news information. Specify which particular radio or TV programs, commentators, newspapers, or magazines you use. Also state whether you get local-state or national-international news from the source.

Media	Time Estimate	Specific One(s) I use	Type of news
Radio			
Television			
Newspapers			
Weekly Magazines			
Monthly Magazines			
Other Persons			

12. Have you attended any lectures during the fall quarter which might be related to the study of American foreign policy? Yes___ No___

If yes, please give subject and speaker: ______________________

13. Have you read any books or articles during the fall quarter (other than those on your required reading list) which you feel are pertinent to the field of American foreign policy? Yes___ No___

If yes, please give titles and authors: ______________________

Course Evaluation continued --

14. After having completed this course in American foreign policy, how would you answer the following opinion questions?

a. In the post-WW II period what percentage of the time do you think the United States has been effective in her foreign policies? Check one.

______ 10%   ______ 30%   ______ 50%   ______ 70%   ______ 90%

b. Do you think the United States is more or less effective in her foreign policy than the Soviet Union? Check one.

______ More   ______ About the Same   ______ Less

c. Given your answer to the above question, about what percentage of the time has the United States been more, about the same, or less effective in her foreign policy than the Soviet Union? Check only one.

______ 10%   ______ 30%   ______ 50%   ______ 70%   ______ 90%

d. State whether you think each of the following factors has contributed much, some, or a little to American foreign policy failures.

Rating	Factor
______	Intelligence and personality of high ranking policy-makers
______	Organizational arrangement by which foreign policy is made
______	Influence of non-governmental groups
______	Types of situations in which foreign policy is made
______	Uncontrollable factors in the inter-national system beyond the boundaries of the United States

e. What percentage of the foreign policy failures of the United States do you think could have been avoided through more foreign policy planning? Check one.

______ 10%   ______ 30%   ______ 50%   ______ 70%   ______ 90%

f. What percentage of the foreign policy failures of the United States do you think could have been avoided by putting better people into office?

______ 10%   ______ 30%   ______ 50%   ______ 70%   ______ 90%

Course Evaluation continued --

15. Had you been able to choose one type of lab session to attend at the beginning of this quarter which would you have preferred?

    Case Study Lab ________ Simulation Lab ________

    Would your preference be different now?

    Yes ______ No______

16. Compared to the regular class materials (texts, lectures, private consultations) which of the following do you feel the case studies (or simulation) contributed to the course for you? Circle one.

    A Lot Some Very Little

17. Would you care to use case studies (or simulation) in other courses which you take? Circle one.

    Favor Very Much Favor Slightly Favor Not Favor

18. Under the word "course" below, list all the courses which you have taken this quarter. Rank order these in terms of your interest in them (1 being the most interesting). Also rank order the courses according to the amount of time you spent on them (1 requiring the most time).

Interest Rank	Course	Time Rank
__________	____________________	_______
__________	____________________	_______
__________	____________________	_______
__________	____________________	_______
__________	____________________	_______
__________	____________________	_______
__________	____________________	_______
__________	____________________	_______

Course Evaluation continued --

19. To the extent that this course has contributed to your education, which of the following has it made its greatest contribution to? _____ (put number here) To which has it made the least? _____ (put number)

    1. Accumulation of factual information about American foreign policy development.
    2. Your capacity and skill in analyzing why particular foreign policies are made.
    3. Your capacity to critically evaluate the adequacies or inadequacies of foreign policy.
    4. Your understanding of the number of factors involved in making foreign policy and the pressures under which policy-makers work.

20. If you feel there are things (for example, a greater understanding of American foreign policy in the Far East or a greater understanding of what American foreign policy should be) which you had thought you'd like to get out of this course and didn't, would you please list them in the following space.

21. The rest of this page if for any additional comments which you would care to make.

FOOTNOTES

#The four persons named bear different kinds of responsibilities for the presentation of this report. Robinson and Snyder originally proposed the research; Anderson contributed a large share to the practical demands of executing the research design; M. Hermann was principally in charge of collection and preparation of the data for analysis; Anderson was primarily in charge of data analysis; and Robinson drafted the final report with Anderson and Snyder contributing substantial portions. In their separate ways, each person was necessary for the completion of the report.

[1] In addition to our use of Inter-Nation Simulation, the same technique has been used at Ohio State University by Professor Richard Sherman of the Department of Economics in a course on national security policy and at the University of Michigan by Professors Henry Bretton and Harold Jacobson in an introductory course in international relations. Professor Lincoln Bloomfield of the Massachusetts Institute of Technology has a political-diplomatic game for use in foreign policy courses. Other forms of simulations or games include Robert C. Wood's local politics game designed for courses at the Massachusetts Institute of Technology and Smith College, and James S. Coleman's election game used at The Johns Hopkins University and in Baltimore high schools.

[2] Casebooks include Alan F. Westin, ed., The Uses of Power: 7 Cases in American Politics. New York: Harcourt, Brace, and World, 1962; Harold Stein, ed., Public Administration and Policy Development: A Casebook. New York: Harcourt, Brace, 1952; and Paul Tillett, ed., Cases on Party Organization. New York: McGraw-Hill, 1963.

[3] Paul S. Greenlaw, Lowell W. Herron, and Richard H. Rawdon, Business Simulation in Industrial and University Education. Englewood Cliffs, N. J.: Prentice-Hall, 1962; a useful directory of management games, including information about basic models, administration, and where further information can be obtained, is in Joel M. Kibbee, Clifford Craft, and Burt Nanus, Management Games: A New Technique for Executive Development. New York: Reinhold Publishing Corporation, 1961, pp. 315-36.

[4] For an introductory reader, see Harold Guetzkow, ed., Simulation in Social Science: Readings. Englewood Cliffs, N. J.: Prentice-Hall, 1962.

[5] James B. Conant, ed., Harvard Case Histories in Experimental Science. Cambridge: Harvard University Press, 1957, 2 volumes. Matilda White Riley, Sociological Research: A Case Approach. New York: Harcourt, Brace, and World, 1963, 2 volumes.

[6] See Guetzkow, ed., op. cit., Stein, ed., op. cit., pp. xx-xiv; and Edwin A. Bock, ed., Essays on the Case Method in Public Administration. New York: Inter-University Case Program, 1962.

[7] See William R. Dill, James R. Jackson, and James W. Sweeney, Proceedings of the Conference on Business Games. New Orleans: Tulane University School of Business Administration, 1961.

[8] Exceptions include Albert Somit, Joseph Tannenhaus, Walter H. Wilke, and Rita W. Cooley, "The Effect of the Introductory Political Science Course on Student Attitudes Toward Personal Political Participation," American Political Science Review, 52 (1958), 1129-32; Sarane S. Boocock, Effects of Election Campaign Game in Four High School Classes. Baltimore: Department of Social Relations, The Johns Hopkins University, 1963, mimeographed. It is also worth noting that Professors Stanley Ericksen and Henry Bretton of the University of Michigan are systematically studying the use of simulation in the latter's course in international relations.

[9] Reviews of the literature by Wilbert J. McKeachie have appeared periodically. See "Research on Teaching at the College and University Level," in N. L. Gage, ed., Handbook of Research on Teaching. Chicago: Rand McNally, 1963, pp. 1118-72; "Impact of New Media on Higher Education," to be published in a volume of papers edited by Bruce Biddle and Peter H. Rossi.

[10] Systematic data on American political scientists have been collected through a mail questionnaire to a random sample of those listed in the Directory of the American Political Science Association and are now being analyzed by Albert Somit and Joseph Tannenhaus. See their progress report, "Trends in American Political Science: Some Analytical Notes," paper prepared for the 1963 annual meeting of the American Political Science Association, New York, September, 1963.

[11] Donald T. Campbell and Julian C. Stanley, "Experimental and Quasi-Experimental Designs for Research on Teaching," in N. L. Gage, ed., Handbook of Research on Teaching. Chicago: Rand McNally & Co., 1963, pp. 171-246.

[12] For an effort to determine some effects of a training program on subsequent administrative performance, see Harold Guetzkow, Garlie A. Forehand, and Bernard J. James, "An Evaluation of Educational Influence on Administrative Judgment," Administrative Science Quarterly, 6 (1962), 483-500.

[13] Harold Guetzkow, Chadwick F. Alger, Richard A. Brody, Robert C. Noel, and Richard C. Snyder, Simulation in International Relations: Developments for Research and Teaching. Englewood Cliffs, N. J.: Prentice-Hall, 1963, esp. Ch. 2-3.

[14] Among cases used in American foreign policy were the following: Chalmers Roberts, "The Day We Didn't Go to War," Reporter, September 14, 1954, pp. 31-35; Raymond H. Dawson, "Congressional Innovation and Intervention in Defense Policy: Legislative Authorizations of Weapons Systems," American Political Science Review, 56 (1962), 42-57; Warner Schilling, "The H-Bomb Decision: How to Decide Without Actually Choosing," Political Science Quarterly, 76 (1961), 24-46; David S. McLellan and Charles E. Woodhouse, "The Business Elite and Foreign Policy," Western Political Quarterly, 13 (1960), 172-90.

[15] Andrew Gyorgy and Hubert S. Gibbs, Problems in International Relations, 2d. ed. Englewood Cliffs, N. J.: Prentice-Hall, 1962.

[16] Among administrative cases were Richard M. Cyert, Herbert A. Simon, and Donald B. Trow, "Observation of a Business Decision," *Journal of Business*, 29 (1956), 237-48; Herbert A. Simon, "The Birth of an Organization: The Economic Cooperation Administration," *Public Administration Review*, 13 (1953), 227-36; Donald Herzberg and Paul Tillett, "A Budget for New York State, 1956-1957," Inter-University Case Program Case 69; Francis E. Rourke, "The Politics of Administrative Organization: A Case History," *Journal of Politics*, 19 (1957), 461-78, also in Bobbs-Merrill Reprint Series in Political Science, PS-248.

[17] D. C. McClelland, J. W. Atkinson, R. A. Clark, and E. L. Lowell, *The Achievement Motive*. New York: Appleton-Century-Crofts, 1953; J. W. Atkinson, ed., *Motives in Fantasy, Action and Society*. Princeton: D. Van Nostrand Company, Inc., 1958.

[18] O. J. Harvey, D. E. Hunt, and H. M. Schroder, *Conceptual Systems and Personality Organization*. New York: John Wiley & Sons, Inc., 1961.

[19] David C. McClelland, *The Achieving Society*. Princeton: D. Van Nostrand Company, Inc., 1961.

[20] Harold D. Lasswell, *Psychopathology and Politics*. Chicago: University of Chicago Press, 1930; *World Politics and Personal Insecurity*. Chicago: University of Chicago Press, 1934; *Power and Personality*. New York: W. W. Norton and Co., Inc., 1948; Arnold A. Rogow and Harold D. Lasswell, *Power, Corruption, and Rectitude*. Englewood Cliffs, N. J.: Prentice-Hall, 1963.

[21] Michael J. Driver, *Conceptual Structure and Group Processes in an Inter-Nation Simulation, Part One: The Perception of Simulated Nations*. Princeton: Educational Testing Service, 1962.

[22] Guetzkow, Alger, Brody, Noel, and Snyder, *op. cit.*, Ch. 6.

[23] We have sometimes been embarrassed by the advantages claimed for Inter-Nation Simulation by some of our friends and colleagues. For example, Ralph M. Goldman has remarked, "Admittedly primitive and oversimplified, these simulations are unquestionably successful in providing the students with insight into many of the decision-making realities with which policy-makers must operate." "The Political Context of Arms Control: A Systems Approach," *Journal of Conflict Resolution*, 7 (1963), 618-46, at p. 639, fn. 9; *Journal of Arms Control*, 1 (1963), 712-40, at p. 733, fn. 9.

[24] For a review of the literature, see Wilbert J. McKeachie, "Procedures and Techniques of Teaching: A Survey of Experimental Studies," in Nevitt Sanford, ed., *The American College: A Psychological and Social Interpretation of the Higher Learning*. New York: John Wiley & Sons, Inc., 1962, pp. 312-34.

[25] C. P. Snow, *The Search*. New York: The New American Library of World Literature, Inc., 1960, p. 23.

[26] William R. Dill, "The Educational Effects of Management Games," in Dill, Jackson, and Sweeney, *op. cit.*, pp. 61-72; Bernard C. Cohen, "Political Gaming in the Classroom," *Journal of Politics*, 24 (1962), 367-81.

[27] Donald T. Campbell and D. W. Fiske, "Convergent and Discriminant Validation by the Multitrait-Multimethod Matrix," *Psychological Bulletin*, 56 (1959), 81-105.

[28] *Handbook: Cooperative Test on Foreign Affairs*. Princeton, N. J.: Educational Testing Service, Cooperative Test Division, 1962.

[29] Garlie A. Forehand and Harold Guetzkow, "The Administrative Judgment Test as Related to Descriptions of Executive Judgment Behaviors," *Journal of Applied Psychology*, 45 (1961), 257-61.

[30] Boocock, *op. cit.*

[31] Fred Greenstein, "The Benevolent Leader: Children's Images of Political Authority," *American Political Science Review*, 54 (1960), 934-43; David Easton and Robert Hess, "The Child's Political World," *Midwest Journal of Political Science*, 6 (1962), 229-46; Heinz Eulau, John Walhke, LeRoy Ferguson, and William Buchanan, "The Political Socialization of American State Legislators," *Midwest Journal of Political Science*, 3 (1959), 188-206.

[32] Richard S. Hatch, *An Evaluation of a Forced-Choice Differential Accuracy Approach to the Measurement of Supervisory Empathy*. Englewood Cliffs, N. J.: Prentice-Hall, 1962.

[33] W. J. Crow and K. R. Hammond, "The Generality of Accuracy and Response Sets in Interpersonal Perception," *Journal of Abnormal and Social Psychology*, 54 (1957), 384-90.

[34] Jerome Bruner, "Going Beyond the Information Given," in *Contemporary Approaches to Cognition*. Cambridge: Harvard University Press, 1957.

[35] G. M. Haslerud and Shirley Meyers, "The Transfer Value of Given and Individually Derived Principles," *Journal of Educational Psychology*, 49 (1958), 293-98.

[36] Lloyd Morrisett, Jr. and Carl Hovland, "A Comparison of Three Varieties of Training in Human Problem-Solving," *Journal of Experimental Psychology*, 58 (1959), 52-55.

[37] See especially, B. R. Bugelski, *The Psychology of Learning Applied to Teaching*. Indianapolis and New York: Bobbs-Merrill, 1964.

[38] Rush Welter, *Popular Education and Democratic Thought in America*. New York: Columbia University Press, 1963.

[39] This research was supported by the Cooperative Research Branch, U.S. Office of Education and Northwestern University under Contract No. OE-2-10-122, Project 1568. We acknowledge also the assistance of the International Relations Program, Northwestern, through funds made available by the Carnegie Corporation of New York and the Illinois Center for Education in Politics. A number of colleagues and students contributed substantially to the formulation and execution of the research design, especially Professor Harold Guetzkow and Messrs. William Caspary, Harold Herman, Adam Prezworski, and Leslie Rothenberg.